JOURNAL

OF THE

Department of Agriculture

OF

WESTERN AUSTRALIA.

Vol. 10. (Second Series) MARCH, 1933. No. 1.

DROOPING FLOWERED CLOVER.

SEED GERMINATION.

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During the season 1931/32, the germination of Drooping Flowered Clover seed was very low, averaging approximately 6 per cent. with a 94 per cent. hard seed content. By means of scarifying with the Ames hulling and scarifying machine, the germination of seed was increased in bulk quantity from 4 per cent. to over 30 per cent. ("Agricultural Journal," June, 1932). In order to obtain an indication of the germination capacity of new season (1932/33) seed, samples were obtained from a number of farmers. The results of tests carried out proved to be far from satisfactory. Out of six samples, two gave germinations of 2 per cent., two of 1 per cent., and two less than 1 per cent., with correspondingly high hard seed contents ranging from 94 per cent. to 99 per cent.

The fact that these lines were mainly hand-cleaned in order to forward me the samples immediately, would tend to give a slightly lower germination figure than the commercial sample, as the cleaning machine has a mild scarifying effect on the seed. Again, the germination tests carried out in the laboratory are concluded after eight days, thus giving the immediately germinable seeds. In the field, after this time has elapsed, a number of the hard seeds germinate at intervals. Those which do so under favourable conditions thrive and add to the pasture, while those seedlings which are produced out of season usually die.

Despite these two reasons for possible increased germination in the field, however, it is evident that, in order to produce reasonable stands this season, it is essential to increase the germination of the seed. The most practical method available is by means of a scarifying machine, such as the Ames hulling and scarifying machine at present used by the Agricultural Department.

The actual value of the increased germination so produced may be shown clearly by taking a specific example. A bulk quantity of Drooping Flowered Clover seed had its germination increased from 4 per cent. to 35 per cent. by means of scarifying. As there are approximately 1,300,000 seeds per lb., with a normal sowing of 4lbs. per acre, the original sample would be capable of immediately producing 43 plants per square yard under ideal conditions, whereas under similar conditions after treatment 376 plants may be produced. The increased stand thus obtained completely outweighs the slight cost and trouble incurred to produce it.

In order to test whether storage or keeping would affect the germination of Drooping Flowered Clover seed which had been scarified with the above-mentioned machine, I conducted the following series of tests:—On 16/3/32 a group of tests was commenced on the original sample—untreated, and after scarification under different conditions, viz., with seed which had been passed through the machine with the fan running at 2,650 r.p.m., at 2,870 r.p.m., and at 2,870 r.p.m., after the sand paper had been brushed (B in table).

On 6/12/32 a corresponding group of tests was begun and the results obtained are shown in the following table:—

Sample.	Germination.		Hard Seeds.	
	16-3-32	6-12-32	16-3-32	6-12-32
Original	<1	<1	99	99
Scarified (2,650 r.p.m.)	41	50	58	48
A. Scarified (2,870 r.p.m.)	47	58	51	40
B. Scarified (2,870 r.p.m.)	44	57	54	40

From these figures it is evident that little change, if any, took place in the germinating capacity of the original sample, whereas the scarified samples showed increases in germination of 9 per cent., 11 per cent., and 13 per cent. respectively.

The results, therefore, indicate that if the seed is kept under suitable conditions after scarifying in the manner mentioned, Drooping Flowered Clover seed shows an even more improved germination than immediately after scarification. It would thus appear that scarifying should be carried out as early as possible, so as to allow the maximum period between treatment and sowing.

The point to be emphasised is that, for this season at least, all Drooping Flowered Clover seed should be scarified, and farmers are urged to only purchase seed which has been treated. A statement should be obtained from the seed merchant giving the percentage purity and germination of the sample exposed for sale. Good average lines of Drooping Flowered Clover seed have about 85 per cent. pure seeds with an immediate germinating capacity of 35 per cent.

BARLEY SMUTS AND THEIR CONTROL.

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Plant Pathologist.

INTRODUCTORY.

Owing to the very low prices at present prevailing in Australia for wheat grain, considerable interest is being taken this year by many farmers in this State in the growing of barley, good lines of which have a very much better value per bushel on the English market at the present time than wheat.

As many farmers in Western Australia will not have grown barley before, it has seemed advisable to sound a warning *re* the prevalence of barley smuts in this State, so that no seed will be planted without suitable disinfection, unless it is definitely known, from personal acquaintance with the parent crop, that the seed has been harvested from a disease-free crop well isolated from barley crops affected with loose smut.

TWO DIFFERENT BARLEY SMUTS—"LOOSE" AND "COVERED."

Barley is subject to attack by two distinct smut diseases—one, caused by the fungus *Ustilago nuda*, being known as "loose smut," the other, caused by *Ustilago hordei*, being known as "covered smut." These two diseases can be distinguished from one another by the fact that in the case of "loose smut" the barley head becomes replaced by a very loose mass of smut spores, which readily blow about in the wind, leaving, by harvest time, only a more or less naked rachis or stalk; whereas in the case of the "covered smut" the barley grains, which are replaced by the smut fungus, remain much more solid in consisteney, and do not break up to

Fig. 1.—"Loose Smut" of barley due to *Ustilago nuda*, showing progressive stages in the development of smutted heads (from left to right).

After photograph by Office of Cereal Investigations, United States Department of Agriculture, in Cornell Extension Bull. 157 (1927).

anything like the same extent, either while on the plant, or during or subsequent to harvesting. "Covered smut" of barley is, in fact, somewhat similar in appearance to the well-known "bunt," "ball smut," or "covered smut" disease of wheat, except that the infected grains, etc., in the case of barley are transformed into a more or less single unit by remaining firmly attached to the stalk. A point worth bearing in mind, however, is that the barley smuts do not attack wheat or oats, and the wheat and oat smuts do not attack barley, the causal fungi being in each case quite distinct.

METHODS OF INFECTION.

Infection of barley by the *"loose smut"* fungus takes place to a large extent during the flowering period. The already-infected plants throughout the field come into ear usually just a little before the healthy plants, and so, when the black smut spores from them are blown about in the wind, they fall on to the developing flowers of the healthy plants and infect the interior of the grains, *without in any way altering their external appearance.* When these infected grains are planted, however, they give rise to plants which will eventually produce heads affected with "loose smut." A certain amount of infection with "loose smut" of barley also occurs during the germination of the grain and the subsequent early stages of development of the seedling, from spores carried mechanically inside or outside the husks.

With "covered smut" *all* the infection takes place at germination time or during the early stages of development of the seedling, from smut spores present either inside, or outside, the husks.

"Loose smut" of barley does not appear to be very prevalent in this State, but "covered smut" is often very abundant in crops grown from undisinfected ("unpickled") seed.

SEED TREATMENT.

1. *Dipping in Bluestone Solution.*

This is not at all satisfactory, except for skinless barley, with which, of course, the brewer and maltster have no concern. The treatment, however, is given here for the sake of completeness, and in case it should happen that, for some reason or other, a farmer has no alternative but to use it.

The seed is dipped in wheat butts, home-made hessian bags, or other suitable non-metallic containers, into a one-and-one-half to two per cent. (1½-2%) solution of bluestone contained in some non-metallic receptacle, such as a large wooden cask. The solution is made up at the rate of one-and-one-half to two pounds (1½-2lbs.) to every ten gallons of water, the bluestone being readily dissolved by suspending it overnight just below the surface of the water in a small sack or piece of hessian.

The barley grain should be dipped in the solution for three to five minutes, stirring all the while, to cause as much rubbish and smut as possible to rise to the surface. This should be skimmed off with a wooden ladle, or scoop, made of hessian or bagging on a wooden frame, and burnt. The grain should be removed at the end of three to five minutes and drained for ten minutes on planks, hollowed logs or sheets of bark, the drainage being allowed to run back into the cask or other wooden container being used.

Galvanised iron or other metallic substances (except copper) must not be used throughout the process owing to the corrosive action of bluestone solutions on metals other than copper.

After draining for ten minutes the grain is dipped for three minutes in lime water, or a slaked lime suspension, made up at the rate of one half pound (½ lb.) of freshly burnt, or freshly slaked, lime, to ten gallons (10 gals.) of water. A fresh lime solution should be made up from time to time. After treating in the lime solution the seed is drained, hung up to dry and sown when convenient. **If by any chance the seed is not treated in the lime solution it must be sown as soon as dry enough to go through the drill, and in a moist seedbed.** A good way to dry the grain is to hang it up in bags, or wheat butts, on poles or straddles for a day before sowing.

2. *Dipping in Formalin Solution.*

This method is much to be preferred to the bluestone method, as it is simpler, and is also more effective in its control of barley smuts. A formalin solution is made up at the rate of one pound (1 lb.) of formalin to twenty-nine gallons (29 gals.) of water, or one pint of formalin to 40 (forty) gallons of water. The grain is dipped into this solution, which may be quite safely used in metal containers, for 3 to 5 minutes. During this period the barley should be well stirred and all rubbish or un-

broken smut masses skimmed off and burnt. After dipping, the grain should be drained and kept in the formalin-moistened bags for two hours, or be spread out on a floor or other suitable place in heaps under bags moistened with the formalin solution and left for two hours. It must then be spread out in a thin layer to dry and **sown in a moist seedbed as soon as dry enough to run through the drill.**

Unless sown as soon as possible after treating, marked reduction in the germination may result. An alternative method sometimes used is to dip in the formalin solution for one hour, then spread out the grain to dry, and sow as soon as dry enough to run through the drill.

Fig. 2.—"Covered smut" of "Pryor's" malting barley caused by *Ustilago hordei* with two average healthy heads *of the same variety for contrast.*

Photo. by Govt. Printer.

3. SPRINKLING WITH FORMALIN SOLUTION.

This is the cheapest effective method yet discovered for general use, and is strongly recommended.

Details.—The seed is spread out in heaps, on a clean cement floor, wooden floor, or tarpaulin, and watered from a watering can with a solution of formalin made up at the rate of 1 pint of formalin to 40 gallons of water, or one pound (1 lb.) of formalin to 29 gallons of water. During this process the barley is shovelled about with a wide-mouthed shovel with frequent turning until every grain is thoroughly moistened. The amount of liquid required is about 1 gallon to every bushel being treated. When thoroughly moistened the heaps are covered with bags

moistened in the formalin solution, and are then left untouched for from five to six hours. The bags are then removed and the grain spread out thinly to dry. *It must be sown as soon as sufficiently dry to run through the drill, and in a moist seedbed, or considerable damage to the germinating power of the seed may result. In any case, when seed has been treated with formalin a few extra pounds of seed should be sown per acre to make up for any reduction in germination possibly brought about by the treatment. This is also desirable because of the swelling of the seed brought about by the treatment.*

This treatment gives good control of "covered smut" and brings about a reduction in the amount of "loose smut" if any is present. It is unable to *completely* remove "loose smut," however, as a considerable amount of the "loose smut" is carried right *inside* the grain out of reach of all ordinary fungicides, as explained near the beginning of this article.

FORMALIN-TREATED GRAIN MUST BE SOWN AS SOON AS DRY ENOUGH TO RUN THROUGH THE DRILL.

It is very important that grain treated with formalin, in any manner, be planted as soon as dry enough to run easily through the drill; and moreover that such seed should only be planted in a moist seed-bed.

The seed may be left over-night, or for 24 hours after treatment with formalin, before being sown, but further delay is very inadvisable, as if left longer than this considerable reduction in the germination power of the seed may take place.

For the same reason formalin-treated grain must be planted only in a moist seed-bed, so that germination will commence immediately after the grain is sown. This means that the treatment of the barley seed with formalin, by any method, must be delayed until sufficient rain has fallen to ensure immediate germination after planting.

4. *Hot Water Treatment.*

This is the most effective treatment for both "loose" and "covered" smuts of barley. **Where carefully carried out it completely controls both these diseases and will give crops quite free of any trace of smut, even though the seed treated was badly infected, provided always that reinfection does not take place from dirty bags, drills, etc., after treatment.** It is now being used on a large scale by the Canterbury Seed Co., N.Z., and New Zealand Breweries, Ltd., with marked success. (See N.Z. "Journal of Agriculture," Feb. 1930, pages 104-107.) It has also been strongly recommended in certain recent American publications. (See "The Control of Cereal Smuts by Seed Treatment," by F. D. Fromme, Virginia Agric. Expt. Sta. Bull. 262, June, 1928.) The treatment consists of soaking the grain in water at ordinary temperatures (60° to 86° F. is preferable) for four to five hours. It is then immersed in water at 120° F. for 1 minute and then for ten minutes in water at 127° F., or at 126° F. for 15 minutes. The temperature must not fall below 124° F. or rise above 129° F. during the process. Every effort should be made to bring all of the grain to the treating temperature at once, by keeping it well agitated. The volume of water at the last two stages should be large, in proportion to that of the amount of seed being treated, so that a big drop in temperature will not occur when the grain is added to the water.

During the treatment a little boiling water may be added with constant stirring to make up for the drop in temperature brought about by the addition of the comparatively cool grain. **After coming out of the hot water it should be immediately immersed in cold water to stop any further action. It is then spread out to dry and sown as soon as it will run freely through the drill. If dried thoroughly it may be bagged and stored for use some time later. At sowing time the rate of seeding per acre should be increased about 10 per cent. to allow for seed injured by the process.**

In this treatment no chemicals of any kind are required, the hot water alone being quite effective in killing both kinds of smut. **The method is hardly practicable**

for small barley growers, except for treating a limited number of bushels for the establishment of a "stud plot" to raise clean seed for the main crops of the following year. It is in this connection that it finds its greatest usefulness. The method is well worthy of consideration by large scale farmers desirous of raising smut-free barley seed for sale, or by such a concern as a big malting company desirous of raising the standard of the barley submitted for malting purposes. Assuming, for instance, only fifty bushels were treated the first year, this would plant 50 acres at the rate of one bushel to the acre. Should the crop from this treated seed yield only 20 bushels per acre (and it might very well give much more with good fertilising, on good land, in a good rainfall district), sufficient seed would be obtained to plant 1,000 acres the next year **without any further treatment.** In New Zealand in the season 1928-29, 4,331 acres of barley were grown in the County of Canterbury with such seed "once removed frm treatment," the results being very successful.

Fig. 3.—"Covered smut" of barley, caused by *Ustilago hordei*.
After McAlpine in "The Smuts of Australia."

DISINFECTION OF DRILLS AND HARVESTING MACHINERY.

It must be clearly borne in mind that none of the above treatments, except possibly the bluestone method, prevent *re-infection* of the barley, after treatment, from old bags, dirty drills, barley-smut-laden harvesters, etc. Before sowing it should therefore be bagged only into clean bags or bags previously dipped in formalin (1 pint to 40 gallons) and then hung up to dry, and the drills should be washed out with a strong formalin solution, made up at the rate of 1 pound of formalin to 2½ gallons of water, to kill any barley smut spores in the drill. Similarly, after using the hot water treatment, before harvesting the grain for the second

season's seed, the harvester should be thoroughly cleaned out, and washed inside, or sprayed from a hand-spraying outfit, with formalin made up at the rate of 1 pound to 2½ gallons of water. Only clean new bags, or formalin-disinfected bags, should be used to hold the grain.

ORGANIC MERCURY DUSTS.

An American organic mercury dust called "Granosan," prepared by and supplied to the writer by courtesy of Messrs. E. I. du Pont de Nemours Co., Wilmington, Delaware, U.S.A., has been used by the writer in co-operation with Messrs. K. T. Lutz and the late E. J. Limbourn of the Wheat Branch of this Department on an experimental scale at Merredin and Perth for the prevention of "covered smut" of barley with great success. It is, however, fairly dear and unobtainable commercially (so far as is known) in Australia at the present time.

"Ceresan," another organic mercury dust, which is used at the rate of 2½ ozs. per bushel of seed in a manner similar to copper carbonate for wheat, can now be obtained from Messrs. Fassett and Johnson, 36-40 Chalmers Street, Sydney, N.S.W., at about 3s. 6d. per lb. It has given very good results in the control of cereal smuts in Germany, U.S.A., and the British Isles, and is certainly very well worth while experimenting with here on a small scale alongside the standard formalin sprinkling method for the control of both barley and oat smuts, as, although relatively expensive, it lacks the many disadvantages of a wet treatment. This material has only just appeared on the West Australian market and no experiments have yet been possible locally. So far as is known to the writer this is the only organic mercury dust available locally, on a commercial scale, for the prevention of cereal smuts.

Organic mercury dusts have the advantages that they are very easily applied to the grain by the use of the same sorts of machines as are used for the "dry pickling" of wheat with copper carbonate; they can be applied at any time before the seed is sown; treated seed can be planted, if desired, in a dry seedbed without injury; and reinfection, after treatment, from dirty drills, bags, etc., is prevented.

COPPER CARBONATE.

Copper Carbonate dust is not sufficiently effective for the control of barley smuts to enable it to be used with any very great degree of success, as has been amply demonstrated in experiments carried out by this Department in the past two years. Detailed reports of these experiments will be published at a later date. In these experiments copper carbonate and "Granosan" were used at the rate of 3 ounces of dust per bushel. The formalin-sprinkling treatment, outlined above under "3," was employed for comparative purposes. "Granosan" and formalin were about equally effective and very successful, but copper carbonate only moderately so.

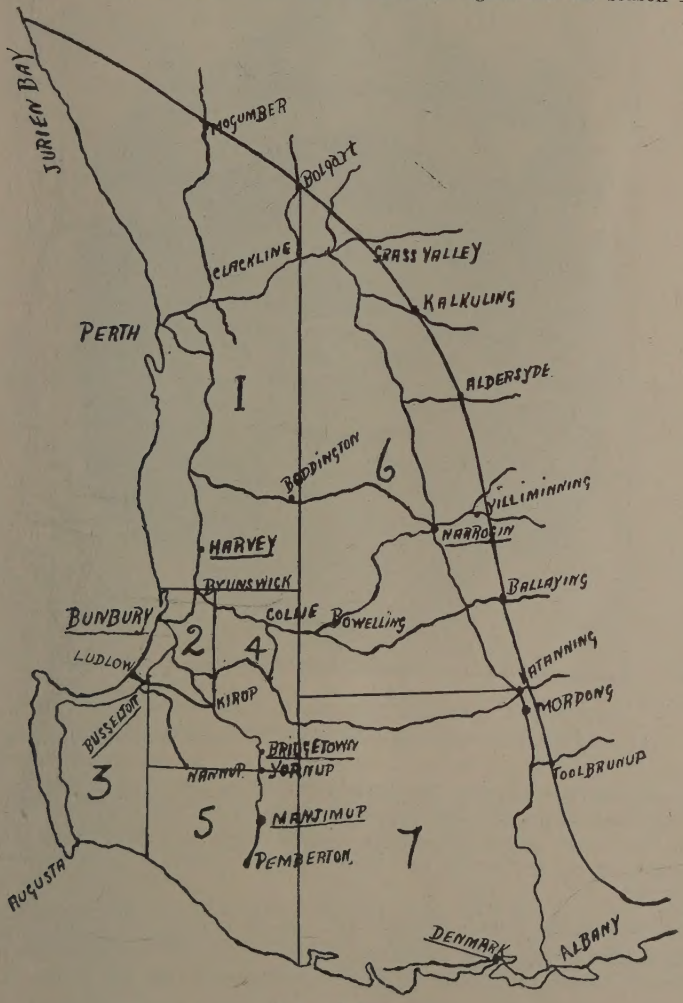
BARLEY SEED TO BE GRADED BEFORE DISINFECTION.

Before barley seed is treated with any kind of disinfectant, it should be well graded, and as much as possible of the smut masses removed.

THE BETTER DAIRYING COMPETITION.

G. K. BARON-HAY,
Superintendent of Dairying.

As the result of the extremely useful information which was obtained last year from the Better Dairying Competition, the Local Committee of the Australian Dairy Council decided to continue the Competition again for the season 1932-33.



Map and zones.

Whereas for the previous year approximately 60 entries were received, no less than 160 entries were received this year, which alone is an indication of the value and interest with which the Competition is regarded by farmers.

Cuming Smith and Mt. Lyall Farmers' Fertilisers, Ltd., have generously donated a Shield to be held by the Zone in which the four leading farms are situated, this Shield to be competed for five years and finally held by the Zone which has won it the greatest number of times.

Shield donated by Cuming Smith Mt. Lyell Farmers' Fertiliser Co.
To be held by the zone containing the four leading farmers.

No entries were received for Zone 6, embracing the great Southern District, last year, owing to the fact that the farms there are not run solely as dairy farms, and for this reason special points were allotted to this area this year with the view of encouraging the production and conservation of fodder for feeding during the lean months.

The reports for Zone 6, embracing the Great Southern District, and Zone 1, embracing the District from Perth to Brunswick, and which were judged by Agricultural Adviser H. G. Elliott, are given below.

ZONE 6.

This Zone, embracing the area from Bolgart to Mt. Barker, was judged separately from the other Zones, owing to it being in a lower rainfall area, the rainfall being 20 to 30 inches per annum.

The principal points were allotted for Silage and Summer Fodders.

The entrants in this Zone were as under:—

Messrs.—

W. G. Burges—York.
E. McManus—Northam.
L. P. James—Cranbrook.
R. McDougall—Narrogin.
T. A. Hardie & Son—Narrogin.
D. Bradford—Narrogin.
W. Chester—Mt. Barker.

The following farmers entered but later withdrew:—

Messrs.—

W. F. Weise—Narrogin.
T. N. Hogg—Narrogin.
J. Callan—Narrogin.

The prize winners were:—

First: W. G. Burges—York.
Second: E. McManus—Northam.
Third: D. Bradford—Narrogin.
Fourth: T. A. Hardie & Son—Narrogin.

The details of the points allotted are given in the table hereunder:—

	Fodder Conserved per head.	Use of Phosphatic Licks.	Silage.	Fodder Crops.	Total Points.
	50	25	100		175
W. G. Burges ...	50	25	50	42	167
E. McManus	50	20	47	35	152
D. Bradford	50	25	35	35	145
T. A. Hardie & Son	50	20	34	35	139
L. P. James	50	...	...	85	135
W. Chester	37	20	35	41	133
R. McDougall ...	43	10	...	75	128

Where both silage and fodder crops were provided the scale of points in each instance was halved, so that the total points remained at 100.

In every case oaten and wheaten hay were not considered under conservation, as it is the practice of farmers in this zone to have ample conserved for other stock. Meadow hay was calculated under fodder conserved per head.

The first prize winner, Mr. W. G. Burges, "Tipperary," York, is to be congratulated on his fine winning entry. He has three silos which contain just over 200 tons of silage of excellent quality, the material ensiled being oats and peas and oats and vetches. The amount of wastage throughout was practically nil, and the silage was of the brown acid type relished by the milking herd.

Mr. Burges conserves a huge quantity of fodder yearly, it averaging out at about 5 tons of dry material per head of dairy stock. The principal material conserved is meadow hay, oats and peas, oats and vetches, pea hay, silage, lucerne hay, etc. The cows have sudan grass for grazing and are also fed green lucerne which is grown under irrigation.

All the competitors, with the exception of one, grow good supplies of sudan grass for grazing. This grass appears to be the best suited to the existing climatic conditions which are too severe for most other summer green fodder crops, with the exception, perhaps, of Japanese millet, but it does not stand up to grazing as well as the sudan grass, being more easily pulled up.

The seed is planted at the rate of 4 to 8 lb. per acre on well-worked ground. The best results are obtained from land that has been fallowed and efficiently worked prior to planting. Fertiliser consisting of superphosphate is applied at the rate of 1 cwt. to 1½ cwts. per acre and drilled in with the seed to a depth of 2 to 3 inches according to the amount of soil moisture present.

Meadow hay was conserved on nearly all farms in the competition and in most cases was of good quality. The material consisted mainly of annual grasses and clovers, principally subterranean clover. The chief faults with the meadow hay conserved were:—

(a) Cutting of the material too late, the grass constituents being allowed to become too mature.

Where grasses predominate in the mixture, cutting should take place when the grasses are in the full flowering period.

(b) Allowing the material to remain for too long a period in windrows and cocks before carting—this causing a considerable amount of bleaching and loss of nutriment.

Silage was conserved on five farms, two having silos containing silage of excellent quality, being made from oats and vetches or oats and peas. The other three consisted of stack silage, none of which were of high quality, this being due mainly to the material ensiled, i.e., grasses with a little clover combined with incorrect building, stacking, and insufficiency of tonnage. The estimated loss on the stacks was excessively high, being in the vicinity of 40 per cent.

Stock Licks.—The type and kind of licks used were many and varied, and only on one farm visited was lick not being used. The principal one in use, however, was di-calcic phosphate.

Generally speaking, most of the farmers in the Competition in Zone 6 made provision for the conservation of ample fodders and green feed, the conservation per head of dairy cows being:—

1.56 acres Sudan Grass.
1.70 tons Meadow Hay.
3.30 tons Silage.
1.20 tons Hay for Chaff.

ZONE 1.

The entrants in this Zone were as under:—

Messrs.—

L. Temple—Harvey.
T. Briggs—Byford.
H. J. W. Masters—Byford.
S. F. Russell—Serpentine.
S. Bowers—Brunswick.
A. E. Clifton—Brunswick.

L. E. Shackell—Mardella.
D. Bevan—Serpentine.
L. Pearson—Benger.
A. Warburton—Brunswick.
W. Harding—Brunswick.
R. A. Clifton—Brunswick.

The first six only, however, finally submitted their farms for Judging.

The prize winners were:—

First: S. F. Russell—"Wendowie," Serpentine.
Second: T. Briggs—Byford.
Third: H. J. W. Masters—Byford.
Fourth: S. Bowers—Brunswick.

Points allotted were as in Table 1 hereunder; details are shown in Table 2.

TABLE 1.

Name.	Farm Management.	Dairy Herd.	Pasture and Fodder Crops.	Fodder Conservation.	Utilisation of Skim Milk.	Butter Fat Production per acre.	Total Points.
	75	100	100	150	25	50	500
S. F. Russell	72	92	93	140	*25	50	472
T. Briggs	50	91	75	130	*20	18	384
H. J. W. Masters ...	59	73	71	125	*13	38	379
S. Bowers	40	85	59	120	*23	44	371
L. Temple	52	92	74	81	24	46	369
A. E. Clifton	37	70	59	107	*24	21	318

* Whole Milk Suppliers.

The first prize winner in this Zone, Mr. S. F. Russell, lives on his property, "Wendowie," adjoining the township of Serpentine.

This property, which has an excellent frontage along the Serpentine River, is one of 134 acres, 115 of which are used for dairying, the remainder being efficiently utilised for an orchard, mainly citrus.

The dairying portion, 115 acres, is extremely well subdivided into 24 paddocks, averaging about 4¾ acres each. Of this area 9½ acres are irrigated and utilised as follows: 3¾ acres of elephant grass which gives on an average 23 tons of green feed per acre cutting. Two and a half acres are sown with maize giving an average yield of 33 tons of green feed per acre. One acre devoted to the growing of cowpeas which are cut three times during the growing season for feeding along with elephant grass and maize. Cowpeas are very high yielders of green feed rich in protein and, fed in conjunction with maize and elephant grass, make a fairly even balanced ration for cows. The balance of the irrigated area, 2¼ acres, is sown down to permanent pasture consisting of paspalum, perennial rye grass and white clover, which is used principally as a night paddock for the dairy cows.

The meadow hay was made from the annual pastures, which consist principally of subterranean clover, rye grass, and other annual grasses and clovers.

The dairy herd is composed of 41 Ayrshire and grade Ayrshire cows. Of the 31 cows at present milking, 21 are heifers. The dairy type is good and the condition of all cows excellent. In addition to the milch cows Mr. Russell carries 17 head of young stock over nine months old, five calves, and one bull.

The dairy sire is a pure-bred Ayshire bull "Purity Director of Wendowie," the sire of this bull being "Director of Gowrie Park," and the dam "Purity of Gowrie Park." This cow gave 404 lb. butter fat and 8,041 lb. milk as a junior two-year-old. The bull is of good type and constitution and was Reserve Champion in 1931 and winner of its class in 1932 at the Perth Royal Show.

Mr. Russell's property produced 53.1 lb. of butter fat per acre during 1932. All milk is sold on a whole-milk basis, and the pigs and calves are fed on whey obtained from the Serpentine Cheese Factory. Concentrates are added to the whey so as to make up for its deficiencies as a calf and pig food.

The pigs on the property at the time of judging were four porkers and one Berkshire-Tamworth sow. All were well housed and in a clean and good condition.

Buildings.—All buildings are strongly constructed, and under the one roof is the milking shed, separator room, engine room, mixing shed, and hay shed. A milking machine is used and kept in perfect condition. The whole floor space is efficiently utilised, and the engine when in operation during milking can be utilised also for crushing oats, etc., or chaff cutting. Electric light is installed in buildings and house, power being obtained from the engine during milking.

Pastures.—The property is well divided with central races. All paddocks are top-dressed annually—half with superphosphate and sulphate of ammonia, and the balance with superphosphate only. The bulk of the pasture consists of subterranean clover and annual rye grasses. Along the river flats paspalum, couch, and clovers flourish. Mr. Russell adopts the system of rotational grazing, and in all paddocks the stock have access to water. Renovation of the pastures is carried out by the use of a skim disc in the autumn, followed periodically by chain harrows for distributing the animal droppings.

Irrigation is carried out for the orchard, etc., by the use of an engine and pump which delivers over a quarter million gallons in 10 hours. From this system water is laid on to the house, garden, milking shed, and dairy.

GENERAL.

Pastures.—The bulk of the pastures judged in Zone 1 were of the annual winter and spring type consisting of Subterranean clover, Cluster clover, *Bromus sp.*, Rye grass, and other annual grasses and clovers. The undesirable barley grass (*Hordeum murinum*) occurs most on the older, non-renovated pastures, and in some instances it constituted the bulk of the pasturage. It is pleasing to note, however, the ever-increasing stand that the annual types of rye grass, such as Wimmera Rye grass, are making. The average number of acres to one cow is 3.86, or 2 acres to every head of dairy stock kept.

Top-dressing with superphosphate and, in some cases, with superphosphate and ammonia is carried out on all competitors' farms. Some of the farmers apply an autumn and spring dressing, while others only top-dress annually. Renovation of the pastures by means of harrows and ploughing is carried out fairly extensively. The results show that, where mixed, well-fertilised and rotationally-grazed pastures occur, the highest return for butter fat per acre are obtained.

Silage.—All the silage judged, with the exception of that on one farm, was in stacks, and in all cases the silage was of the dark, sweet type, made principally from grass and suberranean clover pasture. All stacks were well built, and the percentage wastage generally was low. The amount of silage conserved per head of dairy cows in this Zone worked out at 0.81 tons.

Meadow Hay.—Generally speaking, the hay in this Zone was of good quality, but in some cases cutting was a little on the late side, consequently some of the grasses were too mature to make ideal hay, 0.75 tons of hay being conserved per head of dairy stock.

Dairy Herds.—On the whole the herds were found to be in excellent condition, and on all farms uniformity in type was a distinct feature. Pure-bred bulls are in use on all the farms, and in the majority of cases the bulls were from high-producing cows.

Pigs.—Throughout this Zone the number of pigs kept equal one pig to four cows, the smallness in the number of pigs being due to the fact that nearly all of the competitors were in the whole-milk trade. The principal type of pigs kept were Berkshire and Tamworth, and Berkshire-Tamworth cross.

Stock Shelter.—Shade in the paddocks from trees in some cases was not sufficient. Farmers should realise that protection and comfort for their dairy herds is as equally important as food and water, and that the maximum production cannot be obtained unless all these are in abundance.

Table 2.

	Max. Points.	S. F. Russell.	T. Briggs.	H. J. W. Masters.	S. Bowers.	L. Temple.	A. E. Clifton.
1. Farm Management—(75 points):							
(a) Lay-out and Convenience ...	30	29	19	24	15	22	18
(b) General Management, including Sanitation, etc.	25	23	16	19	16	21	14
(c) Book-keeping and Records ...	20	20	15	16	9	9	5
2. Dairy Herd—(100 points):							
(a) Breeding—System of	25	23	23	20	21	22	18
(b) Dairy Type and Condition ...	30	26	26	23	26	25	20
(c) Bull (give particulars of breeding and production ancestry) ...	25	25	25	20	20	25	18
(d) Pigs—breed, condition, etc. ...	20	18	17	*10	18	20	14
3. Pasture and Fodder Crops—100 points):							
(a) Pasture	60	†85	37	†71	37	†74	†59
(b) Fodder Crops	40	†71	38	...	22	†69	...
4. Fodder Conservation—(150 points):							
(a) Silage—							
1. Succulency	20	...	20	18	20	...	18
2. Mixture	20	...	17	17	18	...	17
3. Type of Silage	10	...	9	8	8	...	8
4. Percentage Waste	20	...	16	17	17	...	14
(b) Hay—							
1. Mixture	20	19	16	18	18	...	18
2. Condition	20	19	13	18	18	...	10
(c) Amount of Fodder conserved per head	20	20	14	13	8	7	7
(d) General Lay-out for convenience in feeding	20	19	15	16	13	15	15
5. Utilisation of Separated Milk for Pigs, Poultry, etc—(25 points):							
(a) Pigs	20	*20	*16	*10	*19	20	*20
(b) Poultry	5	5	4	8	4	4	4
6. Butter Fat Production (per acre) ...	50	50	18	38	44	46	21
Acres devoted to Dairy Farming ...	...	115	300	90	110	89	200
	500	472	384	379	371	369	318

* Partly or wholly on the whole milk trade. † Calculated on a *pro rata* basis.

HORTICULTURAL NOTES.

(G. W. WICKENS, Superintendent of Horticulture.)

When this number of the "Journal" is issued in March, fruit export, both of the dried and fresh product, will be in full swing, and cables will be awaited by growers and shippers anxious to learn how the fruit arrived on the market and what prices were realised. Had the season continued in the new year in the favourable manner experienced in the last months of the old, much more satisfactory export conditions would have obtained, but the extreme heat in February caused considerable damage to fruit crops and has certainly lessened the quantity available for export. Amongst the apples, Jonathans were the worst affected, for not only were many fruits scorched brown on the trees, but a phenomenal shedding took place, 50 per cent. to 75 per cent. of the crop in some orchards falling. As Jonathans were bearing heavily this season, the loss to growers is a severe one. Cleopatras, Granny Smith, and Dunns scorched rather badly in orchards where the trees were heavily laden, but there was no abnormal shedding of these varieties.

Vineyards also suffered severely, and though currants and sultanas were too advanced to be greatly harmed, muscats were badly affected and a large proportion of the crop was ruined, while export varieties also sustained damage.

I have not mentioned the above results of the heat wave just for the purpose of telling a doleful tale, but I want to impress upon growers and packers that it is no use sending heat damaged fruit to the ports and expecting to receive a permit for it. The need for supplying the overseas markets with fruit of good quality and appearance was never more urgent than now, when competition with other countries is so severe, and sunburned fruit lacks both quality and appearance and *must* be thrown into the discard. Already a number of cases of grapes, sent forward for one of the early boats, have been rejected on account of wilted berries, and the same will happen if sunburned apples or pears arrive.

I shall also take this opportunity of issuing a further warning in regard to San Jose infested fruit; although the pest named is not a very difficult one to control and does not do as much damage to fruit and trees in this State as red mite—Bryobia—the fact remains that other countries in the world where it is not present, are taking the most drastic steps to prevent its introduction, and if infested fruit is found at the port of entry, not only will it be refused admission, but quite possibly prohibition of all future consignments will be enforced against the country of origin. Because of this, no fruit found to be infested with San Jose scale will be passed for shipment, and, if the infestation is at all severe, the whole line will be rejected.

Fruit growers in all districts will have noticed this season a marked increase in the number of trees with leaves affected by chlorosis, and they will be pleased to know the Department has arranged to conduct experiments in an endeavour to find a treatment to control the trouble.

Growers of stone fruits have had more than their share of misfortune this season. Not only has fruit fly been more in evidence than last year, but Rutherglen bug appeared in plague form and took heavy toll of the crop. When it comes in millions, as it did this season, it is nearly impossible to suggest any successful method of control. Fortunately, however, these visitations are rare, for though the insect is always here, the damage done to fruit is usually negligible. Fruit fly is not in the same category, for effective measures of control are well known and though baiting, trapping and destruction of all infested fruits entails a lot of labour, the results are worth the effort.

Three pleasing facts can be chronicled to counterbalance some of the reverse sort set out above—the State still remains free from Codlin Moth, Apple Scab, and Phylloxera.

FIELD EXPERIMENTS WITH WHEAT, 1932.

DAMPAWAH EXPERIMENT FARM.

I. Thomas, Superintendent of Wheat Farms.
F. Gishubl, Farm Manager.

The farm is situated 30 miles east of Perenjori, having been formerly a portion of Karara Station on the fringe of the lower Murchison.

The soil is a red friable loam, uniform in appearance, and was originally timbered with York gum, giant mallee, karara and mulga scrub.

The land was cleared in 1927 and early 1928, and fallowed the same year. It was cropped in 1929, and in 1930 the stubble was utilised for grazing. During July and August, 1931, the land was ploughed, under favourable conditions, to a depth of from 3in. to 4in. with a disc cultivating plough. During late August and early September, it was cultivated with a springtyne implement. Seeding was carried out with a combined cultivator drill.

The following table shows the rainfall registered at the farm since its establishment:—

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for Year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1928 ...	*	*	*	*	164	94	238	142	71	34	743	6	156	*
1929 ...	17	220	64	...	267	234	60	62	18	33	674	120	...	1,095
1930 ...	...	...	93	123	48	404	160	93	22	41	768	31	54	1,069
1931 ...	...	12	3	25	237	113	232	95	131	40	848	179	120	1,187
1932 ...	49	...	56	46	138	91	205	302	59	125	920	6	79	1,156

* No records.

This year the rainfall for the growing period was the highest recorded since the establishment of the farm. Despite this, however, growing conditions were not ideal, particularly for the early and mid-season varieties. No satisfactory falls were received until the 28th May and, in consequence, germination was delayed until early in June. During the latter month, which was comparatively dry, several severe frosts were experienced. Both these factors further retarded the growth of the crop.

Conditions were excellent throughout July and August, but during September only 59 points of rain was registered in three falls. In addition, two severe frosts adversely affected the crops, particularly the early varieties. The very early maturing variety, Noongaar, was the least affected. The mid-season maturing varieties received some benefit from the October rains, which this year were considerably above the average.

Time of Seeding Experiment.

The object of this experiment is to determine the most suitable month to plant the wheat crop.

In previous years the varieties used were the mid-season variety Nabawa, planted in April, May and June, and the early maturing variety Gluyas Early, planted in May, June and July. As it has been found that mid-season varieties are too late for this district, the experiment was re-arranged this year. Gluyas Early is now planted in April, May and June, and the very early maturing variety Noongaar in May, June and July.

The results obtained are tabulated below:—

TIME OF SEEDING EXPERIMENT.

Variety—Gluyas Early. 22 % Superphosphate—90lbs. per acre. Seed—45lbs. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
20th April	14 0	13 52	14 0	13 20	13 28	13 44	95
20th May	13 36	14 40	14 16	14 24	15 12	14 26	100
20th June	8 8	8 0	6 48	8 8	6 40	7 33	52

TIME OF SEEDING EXPERIMENT.

Variety—Noongaar. 22 % Superphosphate—90lbs. per acre. Seed—45lbs. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
20th June	16 32	17 4	17 4	15 44	15 4	16 18	81
20th May	21 28	20 24	20 56	18 40	19 28	20 11	100
20th July	1 52	1 36	2 8	1 52	2 0	1 54	9

Although the results with these two varieties are for one year only, they confirm the findings at other experiment farms in the areas of lighter rainfall, viz., that it is unwise to extend the seeding period beyond the end of May, even when a very early maturing variety is used.

Rate of Seeding Experiment.

The object of this experiment is to ascertain the most economical rate at which to plant the wheat crop with—

(a) A mid-season free-stooling variety;

(b) An early sparse-stooling variety.

To meet these requirements, the variety Nabawa was used in the first case, and the variety Noongaar in the second.

RATE OF SEEDING EXPERIMENT.

Planted on 20th April, 1932. Variety—Nabawa. 22 % Superphosphate—90lbs. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre. 1932.	Percentage Yields. 1932.	Average Yields per acre. 1929–32.	Percentage Yields. 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb.	11 52	11 44	11 12	10 24	11 52	11 25	98	10 48	106
45lb.	12 0	11 44	10 56	11 28	11 52	11 36	100	10 13	100
60lb.	11 52	11 28	11 20	12 16	10 40	11 31	99	9 41	95

RATE OF SEEDING EXPERIMENT.

Planted on 19th May, 1932. Variety—Noongaar. 20 % Superphosphate—90lbs. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32*	Percentage Yields, 1929–32*
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30lb.	21 20	22 32	20 32	20 16	20 56	21 7	97	14 31	100
45lb.	22 0	22 48	20 56	20 40	22 24	21 45	100	14 31	100
60lb.	22 16	23 44	21 4	21 44	21 44	22 6	102	14 19	99

* Excluding 1930.

The results again indicate that little or no advantage is obtained by sowing at a rate in excess of 30 lbs. per acre.

Rate of Application of Superphosphate Experiment.

This experiment is divided into two sections in order to test the effects of applying the following amounts of superphosphate per acre with the wheat crop:

Section 1—No super.
150 lbs. per acre (control).
75 lbs. per acre.
Section 2—225 lbs. per acre.
150 lbs. per acre (control).
300 lbs. per acre.

The results obtained are tabulated below:—

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 4th May, 1932. Variety—Gluyas Early. Seed—45lbs. per acre.

Rate of Application of 22 % Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32*	Percentage Yields, 1929–32*
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
225lb.	18 0	18 40	17 20	17 44	17 4	17 46	101	15 55	99
150lb.	18 32	16 40	16 40	17 28	18 40	17 36	100	16 4	100
300lb.	19 44	18 0	18 24	18 8	18 24	18 32	105	16 23	102

* Excluding 1930.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 4th May, 1932. Variety—Gluyas Early. Seed—45lbs. per acre.

Rate of application of 22 % Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32*	Percentage Yields, 1929–32*
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
No Superphosphate ...	6 32	6 32	6 16	7 44	6 24	6 42	37	6 44	41
150lb.	18 40	18 8	18 16	18 8	18 8	18 16	100	16 32	100
75lb.	16 56	16 16	17 12	16 8	16 8	16 32	90	15 14	92

* Excluding 1930.

The results confirm those of previous years and also those obtained at other experiment farms in indicating that no advantage is derived from applying superphosphate at rates in excess of 150 lbs. per acre. With wheat at its present price the optimum quantity to apply would appear to be somewhat above 75 lbs. per acre and would probably be from 90 to 100 lbs.

Seasonal Planting Experiment.

The objects of this experiment are—

(a) To ascertain the most suitable month to plant the late, mid-season, early and very early maturing varieties of wheat;

(b) To determine the most prolific of each of the above types.

To meet the requirements of the experiment, three sections were planted, viz.:

(a) Section 1, planted in April, representing early planting;

(b) Section 2, planted in May, representing mid-season planting;

(c) Section 3, planted in June, representing late planting.

Each section, planted in its respective month, was repeated five times, all plots being eventually harvested for grain. The standard early variety, Gluyas Early, was planted in the control plots in all sections.

SEASONAL PLANTING EXPERIMENT.

APRIL PLANTING.

Planted on 18th April, 1932. 22 % Superphosphate, 90lbs. per acre. Seed—45lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1931–32.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Bencubbin ...	Midseason ...	12 8	12 32	12 0	11 4	11 12	11 47	89	92
Gluyas Early ...	Early ...	14 24	12 24	12 16	12 48	13 52	13 9	100	100
Totadgin ...	Early ...	14 16	12 48	13 12	12 16	13 20	13 10	100	...
Nabawa ...	Midseason ...	10 48	10 0	8 56	10 32	10 48	10 13	78	77
Gluyas Early ...	Early ...	14 0	12 24	12 32	13 20	13 44	13 12	100	100
Merredin ...	Early ...	14 16	14 40	12 48	13 20	14 32	13 55	105	94
Carrabin ...	Early ...	13 36	12 8	11 36	12 40	13 36	12 48	95	95
Gluyas Early ...	Early ...	14 8	12 48	12 48	13 12	14 0	13 25	100	100
Noongaar ...	Very Early	17 4	14 48	14 32	14 48	16 8	15 28	116	111

SEASONAL PLANTING EXPERIMENT.

MAY PLANTING.

Planted 16th May, 1932. 22 % Superphosphate—90lb. per acre. Seed—45lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1931–32.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Geeralying ...	Early ...	11 36	11 4	11 52	12 32	10 56	11 36	82	69
Gluyas Early ...	Early ...	15 12	12 56	15 12	14 24	13 12	14 11	100	100
S.H.J.	Early ...	12 32	10 8	11 52	13 12	11 20	11 49	83	66
Bencubbin ...	Midseason ...	12 40	9 4	13 36	12 24	11 28	11 50	88	101
Gluyas Early ...	Early ...	14 24	11 36	14 8	14 56	12 0	13 25	100	100
Nabawa ...	Midseason ...	11 4	8 48	11 52	12 32	9 20	10 43	80	75
Carrabin ...	Early ...	15 4	12 0	15 28	15 36	12 24	14 6	99	88
Gluyas Early ...	Early ...	14 48	12 16	16 40	14 32	12 48	14 13	100	100
Totadgin ...	Early ...	13 28	12 0	16 16	13 36	11 44	13 25	94	...
Merredin ...	Early ...	14 56	11 52	18 40	15 12	13 36	14 51	105	89
Gluyas Early ...	Early ...	14 32	12 16	17 12	13 52	13 4	14 11	100	100
Noongaar ...	Very Early ...	16 8	15 28	19 52	18 16	16 32	17 15	122	91

SEASONAL PLANTING EXPERIMENT.

JUNE PLANTING.

Planted on 15th June, 1932. 22 % Superphosphate—90lb. per acre. Seed—45lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1931-32.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Geeralying ...	Early ...	9 44	9 44	12 16	12 48	12 16	11 22	88	94
Gluyas Early ...	Early ...	10 16	10 8	15 28	15 12	13 52	12 59	100	100
S.H.J.	Early ...	9 44	10 24	13 44	13 20	12 24	11 55	93	97
Merredin ...	Early ...	6 16	8 56	13 28	12 32	11 28	10 32	78	88
Gluyas Early ...	Early ...	9 12	12 40	15 52	14 56	14 40	13 28	100	100
Noongaar ...	Very Early...	12 24	14 32	17 28	15 44	15 52	15 12	113	117

The results again indicate that for this district, the early and very early maturing varieties are the most prolific.

Potash-Nitrogen Experiment.

The object of the experiment is to ascertain the effect upon the yield of the wheat crop from the application of—

(a) a nitrogenous fertiliser;

(b) a nitrogenous + a potassic fertiliser

when used in conjunction with superphosphate. Sulphate of ammonia and muriate of potash were used and were applied shortly before seeding.

The results obtained are given below:—

POTASH NITROGEN EXPERIMENT.

Planted on 20th May, 1932. Variety—Gluyas Early. Seed—45lb. per acre.

Rate of Application of Fertiliser per acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
112lb. Sulphate of Ammonia; 112lb. Superphosphate	18 24	18 32	19 20	19 20	19 20	18 59	101
2lb. Superphosphate	18 40	18 32	18 40	18 56	18 32	18 40	100
112lb. Sulphate of Ammonia; 112lb. 11 Superphosphate; 56lb. Muriate of Potash	19 20	20 8	20 8	19 28	19 20	19 41	106

These results which are for one year only, and hence cannot be taken as conclusive, show that the addition of sulphate of ammonia gave practically no result, while there was only a slight response when both sulphate of ammonia and muriate of potash were added. This increase, however, is insufficient to cover the cost of the fertiliser.

FIELD EXPERIMENTS WITH WHEAT, 1932.

CHAPMAN EXPERIMENT FARM.

I. THOMAS, Superintendent of Wheat Farms.
F. L. SHIER, Farm Manager.

The following table shows the monthly rainfalls, as recorded at the farm, during 1932, together with the averages over the past 27 years:—

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for Year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1932 ...	118	*Nil*	61	113	356	182	366	556	112	144	1,716	3	33	2,044
Av. 27 yrs.	28	44	62	47	247	421	401	275	162	97	1,603	31	26	1,841

The season promised to open well with early April rains which germinated weed seeds and enabled the fallowed land to be cultivated. Following these rains, however, a dry period, lasting until towards the end of May occurred. Strong drying winds were also experienced. Ideal seeding conditions thus prevailed until planting operations were completed on the 20th June. During this period, further cultivations were necessary to check weed growth on the fallow.

Heavy rains were experienced during July and August, the registrations for the latter month being particularly high. Satisfactory finishing rains fell during October.

The land on which the experiments were conducted, originally carried jam and wattle timber and had been cleared for many years.

It was ploughed to a depth of four inches with a mouldboard plough during July of the previous year. This was followed by a springtyne cultivation in September, again in April after rain, and again immediately prior to planting.

The plots which were planted in June and July received additional cultivations to assist in controlling weed growth.

Time of Seeding Experiment.

This experiment was commenced in 1923, and since then has been planted each year with the early maturing variety Gluyas Early. Owing, however, to the plots being destroyed by fire in 1924 and other factors interfering with the experiment in 1925 and 1926, the results were not obtained for these three years.

Commencing in 1928, the midseason variety, Nabawa, was included in the experiment.

Each variety was planted as a separate experiment, the Gluyas Early being planted in mid-May, June and July, and the Nabawa in mid-April, May, and June. The results are given below:—

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. 22 % Superphosphate—112 lbs. per acre. Seed—60lbs. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928–32.	Percentage Yields 1928–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
April 24th	15 44	14 40	17 12	17 52	18 32	16 48	154	10 31	91
May 20th	10 0	10 32	11 20	11 20	11 20	10 54	100	11 32	100
June 17th	10 32	11 20	11 44	13 12	12 48	11 55	109	10 59	95

TIME OF SEEDING EXPERIMENT.

Variety—Gluyas Early. 22 % Superphosphate—112lbs. per acre. Seed—60lbs. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1926-32.	Percentage Yields, 1926-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	...	bus. lb.	%
June 17th	9 4	11 28	12 48	10 56	12 48	11 25	112	12 30	84
May 20th	6 48	9 20	10 40	11 44	12 56	10 17	100	14 52	100
July 15th	7 12	7 4	6 56	6 40	8 24	7 15	70	7 47	52

This year's results are in favour of the April planting rather than the May planting. The June planting results for both the early and the mid-season varieties are also higher than the May planting results. The July planting with the early maturing variety, Gluyas Early, is shown to be decidedly unsatisfactory, this month being too late for wheat planting.

The unusually dry conditions early in May had placed the May planted plots at a disadvantage as against the plots planted in April and also those planted in June.

However, the average results over a number of years show that better yields can be expected when the wheat crop is planted during the month of May.

Rate of Application of Superphosphate Experiment.

The object of this experiment is to ascertain the most profitable rate of superphosphate to apply to the wheat crop.

To meet the requirements, the experiment was designed so that the three-plot system could be maintained. It was, therefore, divided into two sections, viz.:—

Section 1—consisting of three plots which received respectively 300 lb., 150 lb., and 225 lb. per acre;

Section 2—consisting of three plots which received respectively no superphosphate, 150 lb., and 75 lb. of superphosphate.

In each section, the rate of 150 lb. of superphospate was regarded as the control. The results obtained are shown hereunder:—

RATE OF SUPERPHOSPHATE EXPERIMENT.

Planted on 21st May, 1932. Variety—Nabawa. Seed—60lbs. per acre.

Rate of Application of 22 % Superphosphate.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929-32.	Percentage Yields, 1929-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	...	bus. lb.	%
300 lb.	15 20	12 24	10 40	10 32	11 28	12 5	113	14 38	106
150 lb.	12 48	13 12	10 16	8 24	8 48	10 42	100	13 46	100
225 lb.	11 4	11 36	10 8	9 4	9 4	10 11	95	14 20	104

RATE OF SUPERPHOSPHATE EXPERIMENT.

Planted on 21st May, 1932. Variety—Nabawa. Seed—60lbs. per acre.

Rate of Application of 22 per cent. Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32.	Percentage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Nil	6 32	6 32	7 12	7 28	7 4	6 58	63	10 27	75
150 lb.	10 48	10 40	11 12	10 56	11 28	11 1	100	13 55	100
75 lb.	8 16	9 4	10 8	9 36	9 44	9 22	85	12 30	90

The plot receiving no superphosphate would benefit from the residual superphosphate applied in previous years. As the experiment will be planted on the same land each year, this residual effect will gradually disappear.

However, this year's experiment and the average results over four years indicate that the rate of superphosphate could be increased with advantage above 75 lb. per acre.

Although the applications of higher rates of superphosphate give increased yields, the most economical rate under present economic conditions would probably be about 112 lb. per acre.

Seasonal Planting Experiment.

The objects of this experiment are:—

1. To ascertain the most suitable month to plant the late, mid-season, early, and very early maturing varieties of wheat; and

2. To determine the most prolific of each of the above types.

To meet the requirements of the experiment, three sections were needed, viz.:—

(a) Section 1, planted in April—representing early planting;

(b) Section 2, planted in May—representing mid-season planting;

(c) Section 3, planted in June—representing late planting.

In all sections the mid-season maturing variety, Nabawa, was planted in the control plots. The results are given below:—

SEASONAL PLANTING EXPERIMENT—APRIL PLANTING.

Planted on 21st April. 22 % Superphosphate—112lb. per acre. Seed—60lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1928–32.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King	Late	12 48	14 56	12 56	10 48	10 16	12 21	95	84
Nabawa ...	Midseason ...	14 16	13 44	12 48	12 24	12 8	13 4	100	100
Sutton ...	Late	17 44	16 56	18 56	14 56	14 8	16 32	126	†114
Baroota Wonder Early	Midseason ...	20 24	19 20	19 20	16 0	17 20	18 29	140	*115
Nabawa ...	Midseason ...	13 20	14 16	13 52	12 16	12 24	13 13	100	100
Bencubbin ...	Midseason ...	22 32	24 56	22 16	19 4	16 40	21 5	160	†151

* 1928–29 and 1932. † 1930–32.

SEASONAL PLANTING EXPERIMENT -MAY PLANTING.

Planted on 18th May, 1932. 22 % Superphosphate—112lb. per acre. Seed—60lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yields per acre, 1932.		Per-centage Yields, 1932.	Per-centage Yields. 1928-32.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Noongaar ...	Very Early ...	10	56	12	56	10	0	10	24	10	40	10	59	108	82
Nabawa ...	Midseason ...	12	0	10	32	8	32	9	4	10	40	10	10	100	100
Yandilla King	Late	10	40	9	12	6	16	8	0	8	32	8	32	84	92
Sutton ...	Late	15	4	12	32	8	48	11	36	13	4	12	13	122	†114
Nabawa ...	Midseason ...	12	32	10	40	8	0	8	32	10	24	10	2	100	100
Baroota Wonder Early	Midseason ...	14	40	12	32	9	36	12	8	12	56	12	22	124	*103
Bencubbin ...	Midseason ...	14	40	10	24	9	4	12	0	12	40	11	46	117	†118
Nabawa ...	Midseason ...	12	56	8	0	8	16	9	52	10	56	10	0	100	100
Geeralying ...	Early ...	15	28	10	0	10	40	11	28	11	28	11	49	118	99
Totadgin ...	Early ...	17	20	10	40	10	24	12	24	12	16	12	37	128	...
Nabawa ...	Midseason ...	12	8	8	0	8	32	10	16	10	24	9	52	100	100
Comeback ...	Early ...	12	8	8	56	8	40	9	52	9	52	9	54	100	‡87
Carrabin ...	Early ...	13	20	10	40	9	44	10	0	9	12	10	35	103	97
Nabawa ...	Midseason ...	12	56	8	0	8	56	10	40	11	4	10	19	100	100
S.H.J. ...	Early ...	11	20	9	44	8	8	9	12	8	32	9	23	91	100
Merredin ...	Early ...	13	4	8	16	8	0	9	20	9	28	9	38	92	100
Nabawa ...	Midseason ...	13	52	7	52	9	4	11	4	10	32	10	29	100	100
Gluyas Early	Early ...	15	20	7	52	9	36	11	20	10	32	10	56	104	99

* 1928–29 and 1932. † 1930–32. ‡1929–32.

SEASONAL PLANTING EXPERIMENT—JUNE PLANTING.

Planted on 17th June, 1932. 22 % Superphosphate—112 lb. per acre. Seed—60lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yields per acre, 1932.		Per-centage Yields, 1932.	Per-centage Yields, 1928-32.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Noongaar ...	Very Early ...	11	28	14	16	15	4	13	28	20	0	14	49	86	81
Nabawa ...	Midseason ...	12	32	16	32	17	28	17	28	22	48	17	22	100	100
Sutton ...	Late	11	20	15	28	17	28	18	0	23	44	17	12	99	
Bencubbin ...	Midseason ...	11	52	14	16	18	40	18	8	23	12	17	14	94	†104
Nabawa ...	Midseason ...	12	0	16	24	19	44	20	0	23	36	18	24	100	100
Geeralying ...	Early ...	12	16	14	40	16	48	18	32	22	8	16	53	92	89
Totadgin ...	Early ...	14	32	15	4	10	56	11	28	16	48	13	46	68	
Nabawa ...	Midseason ...	17	20	17	44	19	20	19	4	27	28	20	11	100	100
Comeback ...	Early ...	14	56	13	36	12	56	13	44	21	36	15	22	76	†76
Carrabin ...	Early ...	17	44	14	0	18	0	18	24	27	12	19	4	93	†89
Nabawa ...	Midseason ...	17	44	16	56	20	40	20	0	27	4	20	29	100	100
S.H.J. ...	Early ...	16	48	15	20	18	24	16	56	26	32	18	48	92	91
Merredin ...	Early ...	17	28	14	56	18	24	17	36	27	28	19	10	92	90
Nabawa ...	Midseason ...	18	32	20	16	19	44	17	28	28	24	20	53	100	100
Gluyas Early...	Early ...	14	56	16	40	14	56	16	48	23	12	17	18	83	89

† 1930-32.

This year's results and the average results for previous years show that, with the exception of Yandilla King, all varieties planted in April show to advantage over the control variety, Nabawa, the variety Bencubbin being outstanding.

In the May planting, the results show that, with three exceptions, all varieties equalled or exceeded the yields of the control. In this section the new early maturing variety, Totadgin, has shown to advantage, but as this is the first year it has been included no definite conclusions can be drawn.

The results for this year again demonstrate the suitability of Sutton and Bencubbin for this and other districts having similar climatic conditions.

In the June planted section, contrary to what might have been expected, the yield of the control was not exceeded by the earlier maturing varieties, but was almost equalled by a late maturing variety. The actual yields obtained from the different varieties are greater than those from either the April or May plantings.

This may be accounted for by the excellent rains which fell throughout the growing period and particularly during the maturing period. These rains may also account for the mid-season and late varieties comparing more than favourably with the earlier maturing varieties in the late planted (June) section.

Potash-Nitrogen Experiment.

The object of this experiment is to determine the effect upon the wheat crop of the application of—

(a) A nitrogenous fertiliser;

(b) A nitrogenous + a potassic fertiliser.

Sulphate of ammonia, a nitrogenous fertiliser, and muriate of potash, a potassic fertiliser, were used and were applied to the respective plots separately, a few days prior to seeding. The results obtained are given below:—

POTASH NITROGEN EXPERIMENT.

Planted on 20th May, 1932. Variety—Nabawa. 22 % Superphosphate—112lbs. per acre.

Seed—60lbs. per acre.

Rate of Application of Fertiliser per acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per centage Yields 1932.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	...
112lb. Sulphate of Ammonia, 112lb. Superphosphate	9 4	9 4	9 36	10 16	10 56	9 47	107
112lb. Superphosphate	8 32	8 24	8 0	10 32	10 8	9 7	100
112lb. Sulphate of Ammonia, 56lb. Muriate of Potash, 112lb. Superphosphate ...	9 20	9 28	9 28	10 56	11 52	10 13	112

These results, being for one year only, cannot be taken as conclusive. However, they indicate that a small increase in yield can be expected when a nitrogenous fertiliser is applied, and also a slightly larger increase when both a nitrogenous and a potassic fertiliser are applied in addition to superphosphate. These increased yields, however, would not cover the increased cost of the special fertilisers.

FIELD EXPERIMENTS WITH WHEAT AND OATS, 1932.

MERREDIN EXPERIMENT FARM.

I. Thomas, Superintendent of Wheat Farms.
J. H. Langfield, Farm Manager.

The total rainfall for the year was 1,307 points, of which 1,113 points fell during the growing period (May to October). The following table shows the monthly rainfall for the year, together with the average over a period of 21 years:—

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for Year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1932 ...	51	11	59	42	160	69	231	283	56	314	1,113	...	31	1,307
Av. 21 yrs.	52	54	116	82	136	185	190	152	90	85	838	43	52	1,237

Very little rain fell before 25th May, and consequently it was not possible to work the fallow wet before seeding and control weed growth. June was a comparatively dry month, only 69 points being recorded, but the registrations for both July and August were above the average. During September the rainfalls were scanty, only 56 points being recorded. The October rainfalls were unusually high, 314 points being recorded against the average for this month of 85 points.

The October rains, by reason of their lateness, lost much of their value, except for the late plantings. As a result of these late rains, however, an excellent sample of plump grain was obtained.

The land on which these experiments were conducted originally carried Salmon Gum and Gimlet timber, the soil being typical of such country. For some years the three-year rotation, namely, fallow, crops (chiefly wheat) and pasture, has been practised.

During June, 1931, the land had been ploughed to a depth of 4 inches with a heavy disc plough. It was worked with a disc cultivating plough during September and again just before seeding. Plots which were planted during June and July also received further cultivations after the May rains.

Time of Seeding Experiment.

This experiment has been conducted for the past ten years with the variety Gluyas Early, planted in mid-May, June, and July. During the last four years the mid-season variety Nabawa has also been planted in mid-April, May, and June.

The results obtained this year, together with the average results of previous years, are as under:—

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. 22 % Superphosphate—112 lbs. per acre. Seed—45 lbs. per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per-centage Yields, 1932.	Average Yields per acre, 1929–32.	Per-centage Yields. 1929–32
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
19th April	18 40	19 50	17 0	19 20	21 20	19 14	93	22 37	97
17th May	18 0	21 30	21 40	21 40	19 50	20 32	100	23 16	100
16th June	23 0	24 20	24 20	26 30	20 10	23 40	115	18 2	78

TIME OF SEEDING EXPEEIMRNT.

Variety—Gluyas Early. 22 % Superphosphate—112 lbs. per acre. Seed—45 lbs per acre.

Planted.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per-centage Yields, 1932.	Avergae Yields per acre, 1923–32.	Per centage Yields, 1923–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
16th June	22 32	20 56	20 56	21 44	20 56	21 25	112	21 57	87
17th May	18 0	20 40	18 40	18 32	20 8	19 12	100	25 17	100
16th July	20 48	19 4	18 40	19 12	18 40	19 17	101	13 52	55

Subsequent to the seeding of the April plots no rain fell until 23rd May, consequently these plots had no advantage regarding germination over the May planting, both plantings germinating on 1st June.

The June plots were particularly favoured by the heavy rains which fell during October, when 314 points were registered as against the average for that month of 85 points. These late rains also assisted the July planted plots, giving yields which were inconsistent with those of previous years.

Consideration of the average results obtained over a number of years shows that it is inadvisable to extend the planting period into the month of June. Should it not be possible to complete the seeding during May, it is preferable to plant a suitable midseason-maturing variety in April

Rate of Seeding Experiment.

As in previous years, this experiment was carried out with two varieties, viz., Nabawa, representing the free-stooling varieties, and Noongaar, representing the sparse-stooling varieties.

The land was ploughed in June, 1931, to a depth of 4 inches, and cutivated in September with a ten-furrow disc cultivating plough. It was harrowed early in May and disc cultivated before seeding. The results are set out in the following tables:—

RATE OF SEEDING EXPERIMENT.

Planted on 29th April, 1932. Variety—Nabawa. 22 % Superphosphate—112 lbs. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per-centage Yields, 1932.	Average Yields per acre, 1913–32. *	Per-centage Yields, 1913–32. *
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30 lb.	14 16	16 0	14 40	16 40	15 44	15 28	92	19 10	95
45 lb.	17 20	18 16	15 4	17 20	15 44	16 45	100	20 16	100
60 lb.	17 36	17 44	15 12	16 48	13 52	16 14	97	20 18	100

* Excluding 1914.

RATE OF SEEDING EXPERIMENT.

Planted on 2nd June, 1932. Variety—Noongaar. 22 % Superphosphate—112 lbs. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per-centage Yields, 1932.	Average Yields per acre, 1913–32*	Per-centage Yields, 1913–32*
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
30 lb.	19 52	17 20	15 28	21 28	22 32	19 20	87	18 31	96
45 lb.	22 16	19 12	20 24	25 36	24 8	22 19	100	19 10	100
60 lb.	18 24	17 20	25 44	24 16	21 20	21 25	96	18 50	98

* Excluding 1914.

These results again indicate that in this district it is unnecessary to sow either the sparse or the free-stooling varieties at a rate greater than 45 lb. per acre.

Rate of Application of Superphosphate Experiment.

This experiment is divided into two sections, in each of which plots treated with 150 lb. of superphosphate are regarded as controls. Thus in Section 1 the rates of 300 lb. and 225 lb. per acre are compared with the control rate of 150 lb. per acre, and in Section 2 the rate of 75 lb. per acre and no superphosphate are compared with the same control rate of 150 lb. The results obtained are shown hereunder:—

RATE OF SUPERPHOSPHATE EXPERIMENT.

Planted on 13th May, 1932. Variety—Gluyas Early. Seed—45 lbs. per acre.

Rate of Application of 22 per cent Super-phosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per-centage Yields, 1932.	Average Yields per acre, 1929–32.	Per-centage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
300 lb.	31 28	27 28	26 40	27 12	28 16	28 13	107	28 28	105
150 lb.	29 36	27 20	23 36	24 8	26 48	26 18	100	26 59	100
225 lb.	27 52	28 0	24 24	28 24	26 56	27 7	103	27 52	103

RATE OF SUPERPHOSPHATE EXPERIMENT.

Planted on 13th May, 1932. Variety—Gluyas Early. Seed—45 lbs. per acre.

Rate of Application of 22 per cent. Super-phosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Per-centage Yields, 1932.	Average Yields per acre, 1929–32.	Per-centage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
75 lb.	24 24	24 32	22 32	22 8	20 48	22 53	91	25 2	93
150 lb.	27 28	25 12	26 8	22 24	25 36	25 22	100	27 2	100
Nil ...*	13 4	12 0	11 36	7 28	9 28	10 43	42	15 48	58

The average results for four years indicate that the rate of superphosphate applied per acre should be not less than 75 lbs. per acre, and that the most profitable rate under present economic conditions appears to be about 112 lb. per acre.

Seasonal Planting Experiment.

The objects of this experiment are—

(a) To ascertain the most suitable month to plant the late, mid-season, early, and very early maturing varieties of wheat; and

(b) to determine the most prolific of each of the above types.

To meet the requirements of the experiments three sections were needed, viz.:—

(a) Section 1, planted in April—Representing early planting.

(b) Section 2, planted in May—Representing mid-season planting.

(c) Section 3, planted in June—Representing late planting.

In all sections the standard midseason-maturing variety, Nabawa, was planted in the control plots.

The results are given below:—

SEASONAL PLANTING EXPERIMENT—APRIL PLANTING.

Planted on 19th April, 1932. 22 % Superphosphate—112 lb. per acre. Seed—45 lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1928-32.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King	Late	7 12	10 16	10 0	9 52	10 24	9 33	66	79
Nabawa ...	Midseason ...	12 40	15 44	11 36	16 16	16 16	14 30	100	100
Sutton ...	Late	7 28	7 52	6 24	7 12	9 36	7 42	53	*78
Bencubbin ...	Midseason ...	16 56	18 0	16 0	17 20	19 36	17 34	126	†117
Nabawa ...	Midseason ...	12 40	15 44	12 56	13 52	14 16	13 54	100	100
M 26	Midseason ...	13 44	13 36	10 56	11 44	14 8	12 50	92	...

* 1931-32. † 1929-1932.

SEASONAL PLANTING EXPERIMENT—MAY PLANTING.

Planted on 17th May, 1932. 22 % Superphosphate—112 lb. per acre. Seed—45 lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1929-32.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Yandilla King	Late	11 10	14 20	11 40	11 10	10 50	11 50	63	74
Nabawa ...	Midseason ...	19 10	23 0	21 50	14 0	16 30	18 54	100	100
Sutton ...	Late	8 0	8 30	11 0	6 40	7 10	8 16	44	68
Bencubbin ...	Midseason ...	22 0	26 20	21 40	20 20	17 20	21 32	117	†115
Nabawa ...	Midseason ...	18 0	20 0	20 40	18 10	15 30	18 28	100	100
M 35	Early ...	14 10	17 30	17 30	11 0	16 20	15 18	83	...
Merredin ...	Early ...	21 30	23 50	24 0	18 10	21 0	21 42	123	113
Nabawa ...	Midseason ...	17 30	18 50	20 0	16 50	15 20	17 42	100	100
Geeralying ...	Early ...	17 20	20 40	18 20	14 40	15 0	17 12	97	100
Gluyas Early...	Early ...	19 40	27 50	21 40	18 0	20 10	21 28	116	111
Nabawa ...	Midseason ...	16 20	25 0	17 0	16 10	18 10	18 32	100	100
Totadgin ...	Early ...	24 0	28 10	21 10	22 20	22 20	23 36	127	*128
Carrabin ...	Early ...	15 50	16 10	12 10	11 20	12 40	13 38	71	94
Nabawa ...	Midseason ...	23 50	20 20	20 0	15 40	15 50	19 8	100	100
M 26	Midseason ...	17 40	11 50	10 0	10 40	13 0	12 38	66	...
S.H.J. ...	Early ...	21 10	14 40	11 0	12 20	14 50	14 48	80	92
Nabawa ...	Midseason ...	26 40	19 50	15 40	13 40	16 50	18 32	100	100
Noongaar ...	Very Early ...	17 50	12 40	7 40	7 10	12 10	11 30	62	101

* 1931-32. † 1929-32.

SEASONAL PLANTING EXPERIMENT—JUNE PLANTING.

Planted on 16th June, 1932. 22 % Superphosphate—112 lb. per acre. Seed—45 lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yields per acre, 1932.		Percentage Yields, 1932.	Percentage Yields, 1928-32.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Bencubbin ...	Midseason ...	25	12	24	32	22	56	27	20	21	20	24	16	117	*117
Nabawa ...	Midseason ...	23	44	19	52	20	0	21	4	18	40	20	40	100	100
M 26	Midseason ...	19	52	18	24	18	16	17	36	13	28	17	31	85	...
Merredin ...	Early ...	18	24	17	20	19	12	21	44	20	40	19	28	114	113
Nabawa ...	Midseason ...	17	4	17	44	16	48	19	36	14	32	17	9	100	100
Geeralying ...	Early ...	18	24	17	20	15	36	17	44	13	12	16	27	96	98
Gluyas Early...	Early ...	23	36	20	56	19	44	19	52	14	32	19	44	98	110
Nabawa ...	Midseason ...	27	28	20	0	18	32	19	20	15	44	20	13	100	100
Totadgin ...	Early ...	27	44	25	12	23	20	21	4	24	0	24	16	120	127
Carrabin ...	Early ...	20	32	16	48	21	36	16	0	13	44	17	44	86	95
Nabawa ...	Midseason ...	23	4	22	0	21	20	19	12	17	52	20	42	100	100
M 35	Early ...	17	44	18	0	18	24	12	24	17	4	16	43	81	...
S.H.J.	Early ...	19	52	19	4	18	8	10	32	13	52	16	18	85	89
Nabawa ...	Midseason ...	23	44	22	8	19	20	14	8	16	0	19	4	100	100
Noongaar ...	Very Early ...	26	32	23	20	22	56	18	24	17	52	21	37	114	115

* 1930-32.

The seasonal conditions were particularly unfavourable to the plots planted in April. Germination was retarded until the 1st June, as no rain of consequence fell until 23rd May. Consequently both the April and May plots germinated at the same time. All three plantings were affected by the disease Takeall, the two earlier sections probably suffering more than the later one.

The midseason-maturing variety, Bencubbin, has again shown to advantage in all sections, particularly when planted in April.

The results of the new early variety, Totadgin, in both the two later planting sections, confirm those of last year and are most encouraging.

Of the early maturing varieties, Totadgin, Gluyas Early, and Merredin have given the most satisfactory yields, while Noongaar has demonstrated its suitability as a very early maturing variety for late planting.

Generally the experiment indicates the suitability of early maturing varieties for the Merredin and similar districts. The relatively high yields obtained from the June planting sections are not consistent with previous years' results, but this is due to the abnormal season experienced during 1932.

Potash-Nitrogen Experiment.

The object of this experiment is to determine the effect upon the yield of the wheat crop of the application of—

(a) a nitrogenous fertiliser;

(b) a nitrogenous + a potassic fertiliser.

In addition to an application of superphosphate, sulphate of ammonia, a nitrogenous fertiliser, and muriate of potash, a potassic fertiliser, were used. These were applied to the respective plots, separately, a few days prior to the seed being planted. The results obtained are as follow:—

POTASH NITROGEN EXPERIMENT.

Planted on 20th May, 1932. Variety—Totadgin. Seed—45 lbs. per acre.

Rate of Application of Fertiliser per Acre.	Computed Yields per Acre.										Average Yields per acre, 1932.		Percentage Yields, 1932.
	Section 1.		Section 2.		Section. 3.		Section 4.		Section 5.				
	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%
112lb. Sulphate of Ammonia, 112lb. Superphosphate	24	32	26	48	24	40	21	44	22	32	24	3	98
112lb. Superphosphate ...	25	44	24	48	22	40	25	36	23	44	24	30	100
112lb. Sulphate of Ammonia, 112lb. Superphosphate, 56lb. Muriate of Potash	25	12	24	24	22	8	24	32	21	28	23	35	96

These results, which are for one year only, and hence cannot be taken as conclusive, show that no increase in yield is obtained when an application of superphosphate is supplemented with either a nitrogenous fertiliser or a nitrogenous and a potassic fertiliser.

Oat Variety Trial.

This experiment has been conducted for the past ten years. The variety Mulga, an early dual-purpose oat, is used as the control. Only early and midseason varieties are planted in this experiment, as the late maturing varieties have proved unsuitable for the district. The experiment is divided into hay and grain sections, and includes five varieties.

The yields obtained from both hay and grain sections are given below:—

OAT VARIETY TRIAL—GRAIN YIELDS.

Planted on 27th April, 1932. 22 % Superphosphate—112 lb. per acre. Seed—40lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.						Average Yields per acre, 1932.		Percentage Yields, 1932.	Average Yields per acre, 1930–32.		Percentage Yields, 1930–32
		Section 1.		Section 2.		Section 3.							
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	bus.	lb.	%
Mulga	Early ...	33	0	36	16	33	16	34	11	100	36	32	100
Gidgee ...	Midseason ...	46	8	41	24	38	8	42	0	123	39	5	106
Guyra	Midseason ...	36	0	34	0	24	0	31	13	85	37	24	98
Mulga	Early ...	38	0	35	24	36	16	36	27	100	38	10	100
Mulga	Early ...	39	0	33	0	38	8	36	29	100	38	21	100
Palestine ...	Early ...	29	16	30	32	30	32	30	13	83	37	18	97
Burt's Early ...	Early ...	28	16	27	8	28	0	27	35	77	37	18	95
Mulga	Early ...	37	32	34	24	36	8	36	8	100	39	14	100

OAT VARIETY TRIALS—HAY YIELDS.

Planted on 27th April, 1932. 22 % Superphosphate—112lb. per acre. Seed—40lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.						Average Yields per acre, 1932.			Percentage Yields, 1932.	Average Yields per acre. 1930–32.			Percentage Yields, 1930–32
		Section 1.			Section 2.										
		cwt.	qrs.	lb.	cwt.	qrs.	lb.	cwt.	qrs.	lb.	%	cwt.	qrs.	lb.	%
Mulga	Early ...	48	2	24	48	1	20	48	2	8	100	55	2	22	100
Gidgee ...	Midseason ...	29	3	4	32	3	12	31	1	8	64	59	2	10	107
Guyra	Midseason ...	29	0	16	30	3	20	30	0	4	62	49	0	24	90
Mulga	Early ...	47	2	16	49	1	4	48	1	24	100	54	2	18	100
Mulga	Early ...	43	3	12	44	1	4	44	0	8	100	52	1	26	100
Palestine ...	Early ...	28	3	12	31	2	24	30	1	4	69	44	1	26	85
Burt's Early ...	Early ...	32	3	4	31	2	0	32	0	16	68	48	1	6	91
Mulga	Early ...	47	1	12	46	3	4	47	0	8	100	53	1	4	100

In 1930 the arrangement of this experiment was altered to facilitate harvesting operations, and in consequence the average results of the last three years only are shown.

This year, in the grain section, the highest average yield was obtained from the midseason variety Gidgee. The standard early variety Mulga, which was used as the control, has given highly satisfactory yields both for this and the previous two years. Neither Burt's Early nor Palestine, both early oats, have proved as satisfactory as they were during the previous two years.

In the hay section Mulga has this year undoubtedly proved to be the best variety. The comparative yields from all other varieties are well below those obtained in previous years.

FIELD EXPERIMENTS WITH WHEAT, 1932.

YILGARN EXPERIMENT FARM.

I. Thomas, Superintendent of Wheat Farms.
R. W. Prunster, Farm Manager.

The monthly rainfalls as recorded at the farm during 1932, together with the averages for the past five years, are set out hereunder:—

Year.	Growing Period.													Total for Year.
	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	
1932 ...	58	36	61	65	186	92	121	278	53	210	940	...	36	1,196
Av. 5 years	38	68	48	84	201	134	107	136	48	61	687	77	55	1,057

Although small falls were recorded during the summer and autumn months, they were of little benefit for working the fallow wet, and the normal seasonal rains did not commence until the 28th May, some six weeks later than usual. This gave a late start to all crops planted during April and May. Normal falls of rain were recorded during June and July, while the recording for August was some 142 points above the average for the past five years. Two heavy frosts in September adversely affected the growth of the more forward crops. The heavy rains experienced during October enabled the later maturing varieties to mature under satisfactory conditions in spite of their late start. These late rains were of particular benefit to crops planted in June and July.

The land on which the experiments were conducted was originally timbered with salmon gum and gimlet. During June, 1931, it was disc ploughed to a depth of four inches. This was followed by a springtyne cultivation about the middle of September. During late March and early April, after 60 points of rain, the plots were disc cultivated in order to break up patches which had set down hard and to destroy weed growth. Immediately prior to seeding, the land was cultivated with a springtyne implement.

Time of Seeding Experiment.

The object of this experiment is to determine the most suitable month to plant the wheat crop. To meet the requirements of the experiment, two varieties of different maturity were used, Nabawa representing the midseason, and Gluyas Early the early maturing varieties.

The Nabawa plots were planted in mid April, May and June respectively, and the Gluyas Early plots were planted in mid May, June and July. Each plot was repeated five times.

The yields obtained from the different plantings are given below:—

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. 22 % Superphosphate—112 lbs. per acre. Seed—30 lbs. per acre.

Time of Seeding.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928–32.	Percentage Yields, 1928–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
16th April	17 44	19 44	18 32	21 12	18 40	19 10	84	18 43	102
14th May	21 20	24 8	22 24	24 40	21 20	22 46	100	18 16	100
17th June	16 8	16 32	14 40	14 16	14 32	15 14	67	10 34	58

TIME OF SEEDING EXPERIMENT.

Variety—Gluyas Early. 22 % Superphosphate—112 lbs. per acre. Seed—30 lbs. per acre.

Time of Seeding.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928–32.	Percentage Yields 1928–32
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
17th June	16 16	13 44	14 56	14 8	13 4	14 26	69	12 11	69
14th May	21 20	22 16	21 12	19 28	19 44	20 48	100	17 31	100
15th July	15 36	13 4	15 12	13 44	13 12	14 10	68	6 44	38

Both this year's results and the average results obtained over the five years that the experiment has been conducted show that it is inadvisable to extend the planting period into the month of June.

As indicated in the results, it is better to plant a suitable midseason maturing variety such as Nabawa during the month of April rather than to plant other wheat varieties after the end of May. Midseason varieties will give as good, if not better, results when planted in April rather than May, but with early maturing varieties the latter month is preferable.

Rate of Seeding Experiment.

The object of this experiment is to determine the most economic rate of seeding with—

(a) a midseason, free-stooling; and

(b) an early, sparse-stooling variety.

For the former the variety Nabawa was used, and for the latter the variety Noongaar.

The results of the experiment are as follow:—

RATE OF SEEDING EXPERIMENT.

Planted on 16th April, 1932. Variety—Nabawa. 22 % Superphosphate—112 lbs. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928–32.	Percentage Yields 1928–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
20 lb.	11 36	10 56	11 36	11 52	12 48	11 46	74	16 21	94
40 lb.	16 16	16 8	13 28	17 28	16 16	15 55	100	17 20	100
80 lb.	16 24	14 8	13 4	16 16	17 28	15 28	97	16 53	97

RATE OF SEEDING EXPERIMENT.

Planted on 25th May, 1932. Variety—Noongaar. 22 % Superphosphate—112 lbs. per acre.

Rate of Seed per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928–32.	Percentage Yields, 1928–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
20 lb.	9 20	8 24	8 8	9 44	8 16	8 46	86	13 14	94
40 lb.	10 48	9 52	10 24	9 36	10 32	10 14	100	14 1	100
80 lb.	9 12	8 40	10 40	8 40	9 20	9 18	91	13 49	98

Both this year's results and the average results obtained over five years indicate that the rate of 20 lbs. per acre is insufficient for both the free and the sparse stooling varieties.

With the free stooling variety the rate of 40 lbs. per acre shows a slight advantage over the rate of 30 lbs. per acre.

With the sparse stooling variety, this year's results are decidedly in favour of the rate of 40 lbs. per acre, although the average results do not show such a great advantage over the lesser rate of 30 lbs. per acre.

Rate of Application of Superphosphate Experiment.

The object of this experiment is to determine the most economical rate to apply superphosphate to the wheat crop.

This experiment is divided into three sections, in each of which plots treated with 150 lb. of superphosphate are regarded as controls. Thus, in Section 1, the rates of 300 and 225 lb. per acre are compared with the control rate of 150 lb. per acre, and in Section 2 the rates of no application and 75 lb. per acre are compared with the control rate of 150 lb.

During the period of growth, it was noticeable that the plots which had received no application of superphosphate were later in maturing.

An outside factor interfered with Section 1 of the experiment, rendering the results unreliable. They have, therefore, been discarded. The average results, however, for previous years (1929-31) are shown below, together with this year's results for Section 2.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Variety—Gluyas Early. Seed—30 lb. per acre.

Rate of Application of 22 per cent. Superphosphate per Acre.	Average Yields per acre, 1931.	Percentage Yields, 1931.	Average Yields per acre, 1929–31.	Percentage Yields, 1929–31.
	bus. lb.	%	bus. lb.	%
300 lb.	18 25	105	15 7	98
150 lb.	17 54	100	15 31	100
225 lb.	19 1	106	15 13	98

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on 12th May, 1932. Variety—Gluyas Early. Seed—30 lbs. per acre.

Rate of Application of 22 per cent. Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32.	Percentage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Nil	13 36	14 0	14 56	14 32	15 44	14 34	74	11 21	64
150 lbs.	18 0	17 20	20 8	21 4	21 36	19 38	100	17 38	100
75 lb.	14 40	16 32	17 20	18 24	18 16	17 2	87	15 19	87

These results show that increased yields are obtained when superphosphate is applied up to 150 lb. per acre.

Under present economic conditions, the most economical rate of application appears to be between 100 and 112 lb. per acre.

Seasonal Planting Experiment.

The objects of this experiment are:—

(a) To ascertain the most suitable month to plant the midseason, early, and very early maturing varieties of wheat;

(b) To determine the most prolific of each of the above types.

To meet the requirements of the experiment, three sections were needed, viz.:—

(a) Section 1, planted in April, representing early planting;

(b) Section 2, planted in May, representing midseason planting;

(c) Section 3, planted in June, representing late planting.

Each section, planted in its respective month, was repeated five times, all plots being eventually harvested for grain.

As no rain of consequence fell until 28th May, the germination of the plots planted in April was delayed until early June. Consequently this section had no advantage over that planted in May.

Hereunder are shown the results obtained during 1932, together with the average percentage results of the previous four years.

During this period (1928-31) the variety Nabawa had been planted in the control plots, but the average percentage results are shown hereunder calculated on the basis of Gluyas Early controls. This enables a comparison to be made with the results for 1932 when the variety Gluyas Early was used in the control plots.

SEASONAL PLANTING EXPERIMENT—APRIL PLANTING.

Planted on 15th April, 1932. 22 % Superphosphate—100 lb. per acre. Seed—28 lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1929-31.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Noongaar ...	Very Early ...	8 16	6 24	5 12	4 48	5 20	6 0	40	69
Gluyas Early...	Early ...	16 8	13 44	16 32	16 16	12 48	15 5	100	100
Totadgin ...	Early ...	16 16	14 48	18 24	18 32	14 24	16 29	110	...
Bencubbin ...	Midseason ...	16 0	14 24	19 28	17 12	12 8	15 50	110	144*
Gluyas Early ...	Early ...	14 24	11 20	18 32	15 44	12 16	14 27	100	106
Nabawa ...	Midseason ...	13 4	12 24	19 36	18 16	15 28	15 46	109	111

* 1930-31.

SEASONAL PLANTING EXPERIMENT—MAY PLANTING.

Planted on 16th May, 1932. 22 % Superphosphate—100 lb. per acre. Seed—28 lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Per centage Yields, 1928-31.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Noongaar ...	Very Early ...	6 8	6 8	5 28	7 4	8 40	6 42	39	103
Gluyas Early...	Early ...	14 48	18 0	18 0	17 52	16 24	17 1	100	100
Geeralying ...	Early ...	11 20	12 40	15 4	10 16	12 16	12 19	72	96
Merredin ...	Early ...	14 0	16 40	18 48	8 32	15 12	14 38	86	88
Gluyas Early...	Early ...	15 36	17 28	18 56	16 0	17 36	17 7	100	100
Totadgin ...	Early ...	19 4	19 20	20 40	16 56	19 28	19 5	112	...
S.H.J. ...	Early ...	14 40	15 52	16 56	13 4	14 24	14 59	90	83
Gluyas Early...	Early ...	16 8	18 24	16 24	16 56	15 28	16 40	100	100
Carrabin ...	Early ...	18 8	18 24	17 20	16 0	14 16	16 50	101	91
Bencubbin ...	Midseason ...	18 40	21 36	16 48	18 32	15 4	18 8	116	106*
Gluyas Early...	Early ...	16 24	17 28	16 16	13 36	14 16	15 36	100	100
Nabawa ...	Midseason ...	14 32	17 28	18 16	9 28	17 12	15 23	98	92

* 1930-31.

SEASONAL PLANTING EXPERIMENT—JUNE PLANTING.

Planted on 17th June, 1932. 22 % Super-phosphate—100 lb. per acre. Seed—28 lb. per acre.

Variety.	Maturity.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Percentage Yields, 1928-31.
		Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.			
		bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	%
Bencubbin ...	Midseason ...	16 24	19 20	13 44	18 8	18 48	17 17	121	107*
Gluyas Early...	Early	13 36	15 28	12 0	16 0	14 32	14 19	100	100
Nabawa ...	Midseason ...	16 32	18 24	14 32	17 52	15 28	16 34	116	87
S.H.J. ...	Early ...	12 40	14 56	10 16	14 0	13 4	12 56	89	74
Gluyas Early...	Early ...	13 20	16 40	12 8	15 4	15 28	14 32	100	100
Carrabin ...	Early ...	13 28	14 40	10 48	14 40	15 12	13 46	94	93*
Merredin ...	Early ...	16 0	17 28	13 12	13 44	12 56	14 40	108	86
Gluyas Early	Early ...	13 52	15 36	13 52	11 44	13 4	13 38	100	100
Totadgin ...	Early ...	15 12	18 0	14 24	17 44	13 36	15 47	116	...
Noongaar ...	Very Early ...	16 56	16 48	15 4	13 52	14 16	15 23	110	113
Gluyas Early ...	Early ...	15 20	16 24	12 16	12 24	13 20	13 58	100	100
Geeralying ...	Early ...	14 32	15 4	10 56	11 4	12 48	12 53	92	90

* 1930-31.

The abnormal seasonal conditions of 1932, i.e., delayed seeding rains and also late spring rains, have resulted in the actual yields obtained from all plantings being somewhat similar.

The midseason varieties, Bencubbin and Nabawa, and the early variety, Totadgin, have shown to advantage in all sections, while the standard very early variety, Noongaar, has again proved satisfactory for late planting.

Generally the experiment indicates the advisability of commencing wheat seeding operations with a midseason maturing variety such as Bencubbin or Nabawa planted in April, followed by planting the major portion of the crop in May, the main seeding month, with an early maturing variety such as Gluyas Early or Totadgin and finishing with the proved very early variety, Noongaar.

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OAT VARIETY TRIALS IN THE SOUTH-WEST.

G. K. BARON-HAY, Superintendent of Dairying.

Oat variety trials which are conducted annually by officers of the Dairy Branch were continued during 1932, the results from which are given hereunder:—

At Dardanup the experiment was conducted on the property of J. H. Brett. The results as reported by Dairy Inspector Giles are as follow:—

Soil: Dark friable loam adjacent to creek. Old grass land.

Original Timber: Red Gum.

Drianage: Insufficient.

Rate of Seeding: 2 bushels per acre.

Fertiliser: Superphosphate at the rate of 1¼ cwts. per acre.

Date of Seeding: June 21st. Delayed owing to heavy rains.

Rainfall: During the growing period the rainfall was not recorded.

The variety "Imbros" was included in this trial.

The yields obtained were as follow:—

Green Material.

Variety.	Yield.				Percentage Yield.
	tons	cwts.	qrs.	lb.	
Algerian	7	5	3	6	100
Guyra	6	5	3	11	86
Burt's Early	6	2	0	17	84
Mulga	5	3	1	17	71
Imbros*	10	5	2	26	140

* Included 1932 for first time.

Conditions throughout the greater part of the season were bad, owing to the extreme wet conditions, consequently the crop suffered from waterlogging up to the end of September, but made excellent recovery from then on to harvesting time.

At Denmark experiments were conducted on the properties of J. Illsley, Group 41; and E. A. Russell, Group 42. The results as reported by Agricultural Adviser Elliott are as follow:—

J. Illsley, Group 41, *Denmark.*

Soil: Red karri loam. Old pasture land carrying Subterranean Clover, Red Clover, Cocksfoot, and Ryegrass.

Cultivation: Ploughed on 9th May and harrowed next day. The seed and fertiliser were broadcasted and harrowed in on 16th May.

Rate of Seeding: 2 bushels per acre.

Fertiliser: 2 cwts. superphosphate per acre.

The yields were as follow:—

Green Material.

Variety.	Yield—Average 2 plots.				Percentage Yield.
	tons	cwts.	qrs.	lbs.	
Algerian	4	19	2	0	100
Guyra	5	19	0	0	120
Burt's Early	4	17	1	0	98
Mulga	4	11	3	9	93

During the first two months the "Burt's Early" and "Guyra" were the most outstanding. At the time of cutting, the "Algerian" and "Guyra" were not so mature as the other two varieties, and yet they returned a greater bulk.

The growing conditions during the earlier stages were unfavourable, owing to the continued wet conditions which partly waterlogged the field.

E. A. Russell, Group 42, Denmark

Soil: Grey to black jarrah and sheoak ground newly cleared.

Cultivation: Ploughed and harrowed twice early in May. The seed and fertiliser were broadcasted and harrowed in on 18th May.

Rate of Sowing: 2 bushels per acre.

Fertiliser: 2 cwts. superphosphate per acre.

The yields were as follow:—

Green Material.

Variety.	Yield—Average 2 plots.				Percentage Yield.
	tons.	cwts.	qrs.	lbs.	%
Algerian	3	4	0	21	100
Guyra	2	19	1	19	93
Burt's Early	2	3	1	0	67
Mulga	2	10	1	18	78

A section of the "Guyra" and "Mulga" was a complete failure, owing to the excessively wet conditions and faulty drainage. The "Burt's Early" was the most forward in the earlier stages of growth. As was the case with the experiment at J. Illsley's, the "Algerian" and "Guyra" was not so mature as the other varieties.

For the Denmark area the experiments over a number of years show that "Burt's Early" is the best variety to grow for early feed and that "Algerian" and "Guyra" are preferable for hay.

All the above yields are given on their green weight basis. Farmers wishing to compute the yields to a hay basis can estimate that 100 tons of green weight produce 33 tons hay.

The average of the 28 trials conducted throughout the South-West are shown in the following table:—

Variety.	Yield: Average 66 plots = 23 trials.				Percentage Yield.
	tons	cwts.	qrs.	lbs.	%
Algerian	2	8	0	20	100
[illegible]	2	2	3	9	88
[illegible]	2	2	0	14	87
[illegible]	1	14	1	0	79
Maiga	1	13	3	0	69

These results indicate that for a hay crop "Algerian" has proved more suitable than the other varieties, but in almost every centre it has been noted that for early grazing "Burr's Early" and "Maiga" were preferable, and that the fodder provided by these varieties was more relished by stock than that of "Algerian."

SUBTERRANEAN CLOVER.

(*Trifolium subterraneum*, Linn.)

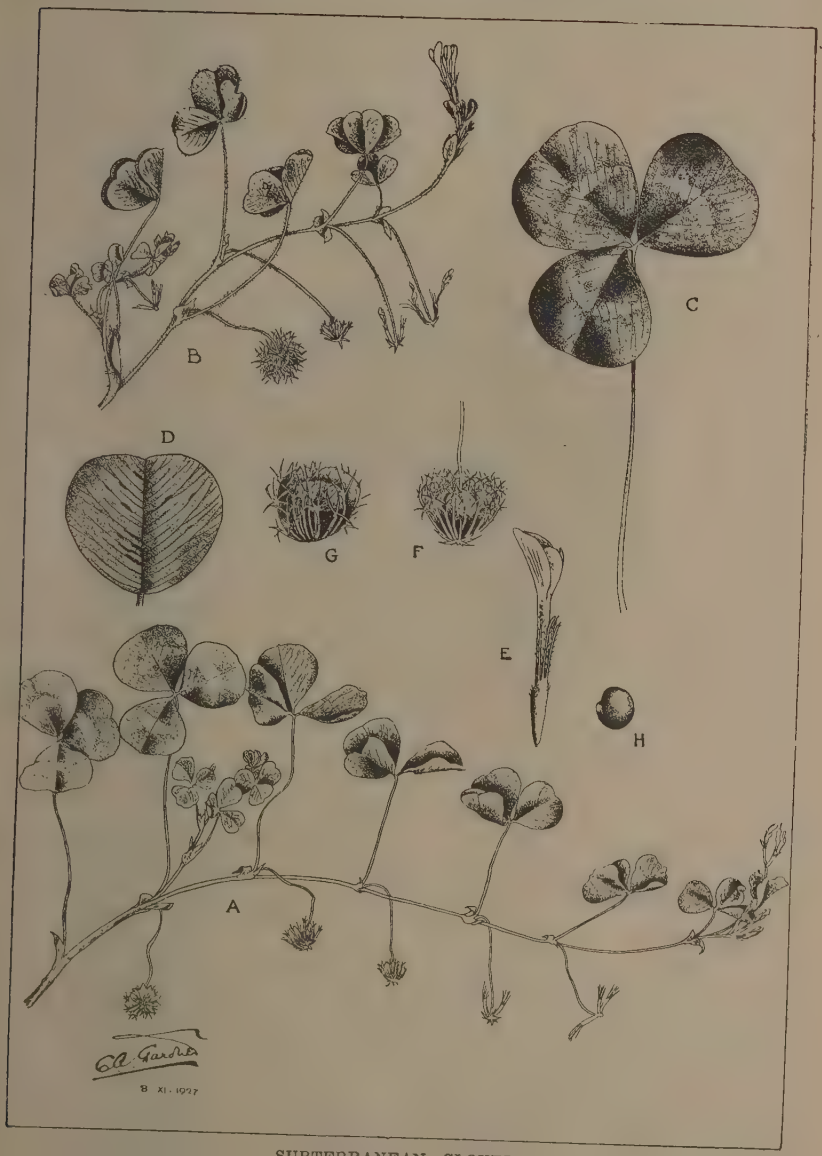
C. A. GARDNER and T. C. DUNNE.

Subterranean Clover received its name from its habit of burying the seed heads in the soil. It is one of the most important annual clovers cultivated in the South-West of Western Australia, and is the most extensively grown species. The first introduction appears to have been made as far back as 1902, but the clover first came into prominence between 1914 and 1917, the seed having been both introduced from South Australia and naturalised here. Such promising results were obtained, that before ten years had elapsed it had become the principal pasture plant of the South-West, being widely grown for pasturage, hay, and ensilage. The clover is highly nutritious, both when grazed or cut for hay. On areas top-dressed with superphosphate, young pastures have given results as high as 30 per cent. protein and 1.5 per cent. phosphorus, calculated on the basis of dry material. The composition of hay will vary from 12 to 18 per cent. protein and .5 to .8 per cent. phosphorus, depending upon the earliness of cutting.

At the present time, where permanent pastures are being established, Subterranean Clover is being to a large extent supplemented by perennial species, but it remains of considerable value by virtue of its ability to thrive in virgin soils, thus preparing the way for permanent pasture constituents, and it still furnishes one of the principal hay crops of the lower South-West. The area of distribution of this clover has extended considerably during recent years, until now it is becoming equally important in the lighter soils of the Great Southern and Midlands districts, and with the evolution of further suitable strains it is expected that the range of the plant will be still further increased.

Description of Plant.

An annual plant of diffuse or spreading habit, extending to a diameter of up to four feet, and usually nine to 18 inches in height under good conditions of growth, usually silky-hairy in the earlier strains, but varying from coarsely



SUBTERRANEAN CLOVER
(*Trifolium subterraneum, L.*).

PLATE I.

Explanation of Plate.

A. and B.—Portion of plant showing habit and development.
C.—Leaf showing whitish crescent-shaped markings.
D.—Leaflet with brown flecking (on veins near midrib).
E.—Flower.
F.—Maturing seed head.
G.—Ripe burr with three pods.
H.—Seed.

hairy to almost hairless. Stipules broad, lanceolate in outline, acute or obtuse. Leaves on long leaf-stalks, erect, the leaves broadly obovate to almost orbicular with the secondary nerves spreading obliquely from the midrib. Flowers usually inconspicuous, produced on long axillary peduncles which are usually hidden amongst the leaves; peduncles at first spreading or erect, but later arching downwards and lengthening after the flowering period, and burying the seed head in the soil.

The flowers are in heads of from three to seven, surrounding a central cluster of abortive flowers which are reduced to short whitish barbed processes, representing the calyx teeth of the abortive flowers. The processes stand erect in the centre of the flower-head, surrounded by the deflexed flowers. As the ripening seed-head curves downwards, the flowers or seed pods assume an erect position, and the barbs of the centre point downwards to the soil, which they enter, acting as anchors which secure the seed-head in the soil. This penetration of the soil can only take place if the soil is loose or moist, or lightened by humus or litter on the surface.

The calyx of the flower varies from green to red in colour; the tube is devoid of hairs, and many-nerved when in fruit, and the awl-like teeth are erect and hairy. The colour of the calyx-tube and calyx-teeth are important in the recognition of the various strains. The standard is long and narrow, and much exceeds in length the calyx-teeth. Although usually white with faint voilet-coloured lines on the back, a pink-flowered form occurs.

The pod contains one seed, which when ripe is large, and a lustrous purple-black in colour. Although usually globular, in the late, or Brunswick variety, it is oval in outline; the radicle (primary root contained within the seed) is usually indicated by a small lateral swelling or protuberance. Three seeds are normally produced in the seed-head or "burr," although the number may be less. They remain within the persistent pods within the burr, from which they can only be readily separated by a process of dehulling. These seeds are easily recognised from those of any other clover by reason of their shape, size and colour.

The original home of the species is Southern Europe and Asia Minor.

The plant is a winter and spring growing annual which dies off with the advent of warm summer weather.

As with other plants which are cultivated intensively, Subterranean Clover has produced several strains of closely related but apparently distinct pure-breeding "varieties" with perhaps cross-breds between those strains which are not pure-breeding. Although the results of the scientific determination of these strains of Subterranean Clover are not yet complete, the following fairly well-marked strains and variety are separable and may be determined by the use of the following key and reference to the plate:—

A.—Stipules shortly acute or mucronate; seeds globular, the radicle usually not very prominent.

a. Calyx-tube pale green with green teeth; plant almost prostrate with scanty foliage and hairy stems; leaflets without markings, when full-grown, but usually a crescent when young .. .. 1. **First Early Strain.**

b. Calyx-tube red, at least in the upper half.

a. Leaflets without markings .. .. .. 2. **Daliak Strain.**

b. Leaflets with a transverse whitish crescent-shaped mark near the centre, the cusps projecting downwards.

I. Leaflets under 2 cm. (⅞in.) long, with a chocolate-brown area below the crescent; flowering season during August* .. .. 3. **Northam Early Strain.**

II. Leaflets 2 cm. long or longer; leaflets with or without a few brown fleckings on the veins, but no definite area below the crescent. Flowering season later than mid-September* .. .. 4. **Midseason Strain.**

B.—Stipules acuminate (*i.e.*, gradually narrowed into a long fine point); seeds longer than broad, with a prominent radicle .. .. 5. **Brunswick Late Variety.**

There is also a pink-flowered form with an entirely green calyx, and a deep rose-pink corolla. The leaves are without any markings. It is probably a form of the First Early Strain.

1. *First Early Strain.*—This strain came originally from Dwalganup, where it was grown by Mr. P. D. Forrest. It is a small plant which has stout trailing stems with comparatively little leafage. Brown fleckings appear in the younger leaves, and white crescent-shaped markings, but the latter disappear in the adult leaf. The thick stems are very hairy. This strain commences to flower early in August. It is a very hardy strain and the one most suitable for the areas of lighter rainfall. The strain is sometimes known as "Dwalganup Clover," or "very early variety," and has been naturalised in the Blackwood district for over 40 years. It is supposed to have been accidentally introduced in Rye Grass seed, probably from Europe. The calyx-tube and teeth are green.

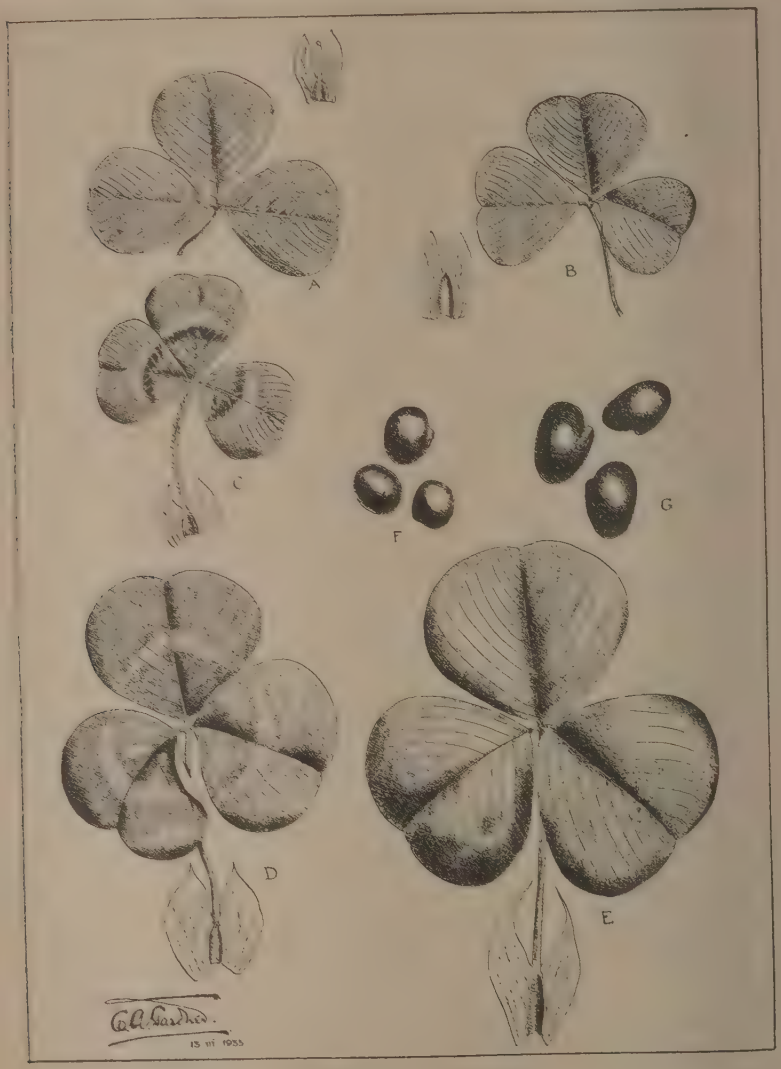
2. *Daliak Strain.*—This strain, also known as "Daliak Variety," or "Monger's Variety," may be distinguished from the First Early strain by its reddish calyx-tube, and the absence of a crescent, even on the young leaves. Like the First Early strain the Daliak strain may have brown fleckings on the younger leaves, but these disappear with age. In both strains the stipules are broad and somewhat obtuse, the stems and leaf-stalks very hairy, and the adult leaves without markings. The Daliak strain was accidentally introduced into the York and Muresk districts by sheep. Sheep have materially assisted in spreading the plant. The flowering season is towards the end of August, about a fortnight later than the First Early strain.

3. *Northam Early Strain.*—This is an early strain which has a white crescent-shaped marking on the leaflet subtended by a chocolate-coloured area. The foliage is more sparse than in the Midseason strain, and the leaflets are smaller, and often rusty-hairy beneath. The flowering season is towards the end of August. This strain has only recently come under observation in the Northam district, where it was found by Mr. A. B. Adams.

4. *Midseason Strain.*—The Midseason strain is the one most commonly cultivated in the lower South-West and the one which has attracted the most attention. The white crescent of the leaflets is most marked, and the plants are densely foliaged. The plant is more prolific than the preceding strains, and frequently attains a height of 18 inches. The calyx is red with green teeth, and the plants are not as a rule very hairy. Some brown flecking usually occurs on the secondary nerves. The flowering season is later than mid-September. This strain is suitable for cultivation as far East as the 25in. isohyet.

5. *Brunswick Late Variety.*—This variety can easily be distinguished from the above strains by its much larger leaves which are usually hairless and of delicate texture, and its seeds which are not globular as in the foregoing, but more oblong with a decided radicle or protuberance on the side. It is a more upright

* The flowering period referred to is from data obtained in the Northam district, and some variation may be expected under dissimilar conditions.



SUBTERRANEAN CLOVER.

PLATE II.

Leaves.

A.—First Early Strain.
B.—Daliak Strain.
C.—Northam Early Strain.
D.—Midseason Strain.
E.—Brunswick Late Variety.

Seed.

F.—Midseason Strain.
G.—Brunswick Late Variety.

Icon. origin.

and strong growing form with long pointed stipules. The variety has various names such as "Wenigup Clover," "Late Variety," and "Brunswick Clover." It first appeared in the Wenigup district, near Bridgetown, but nothing is known of its origin. This variety, which produces the greatest bulk of feed of any of the forms, is only siutable for cultivation in the wetter areas, where it flowers in late October or early November.

The three early strains normally bury all of their seeds, but the Midseason Strain and Late Variety only bury a proportion of the burrs. Hard seeds are present in all strains, especially the early strains, but the percentage is relatively unimportant.

Distribution.

Subterranean Clover is adapted to almost all soils except the dry sandy soils and the wet swampy lands. Although it will withstand considerable flooding during the winter, provided it makes early growth, it is not as well suited for swampy or wet areas as Drooping-flowered Clover. Subterranean Clover has been found suitable for the lighter classes of country, the well-drained clay soils, and the gravelly loams of the South-West and the Darling Range. The species can be grown in any of these types of country within the 17-inch isohyet—an area exceeding the range of Jarrah, and including a large stretch of the Great Southern and Midlands districts. This range may in the future be extended as earlier and hardier strains are evolved, and it is not improbable that at the present time some measure of success might attend endeavours to grow the earlier strains with a rainfall as low as 15 inches.

The Midseason strain and Late Variety are cultivated within the 25 and 35 inch isohyets respectively. Within these areas the wet season is of longer duration than in the lighter rainfall areas, and these two types of clover require this longer growth period in which to mature.

The three early strains are suitable for the zone with an annual rainfall of 17-25 inches in which they make early growth and ripen their seeds earlier than do the later strains. There is less foliage with these plants, and they are more hardy, and a large amount of seed may be formed.

Establishment.

In establishing this clover clean seed alone should be used. Burr harbours and distributes such pests as Lucerne Flea, Red Mite, and Dodder.

1. *Midseason strain and Late variety.*—These clovers, which are grown only in the wetter parts of the South-West, are usually sown as pioneer or introductory plants in pasture establishment. They are sown either (a) in virgin soil following burning, or (b) in cultivated land.

Sowing in virgin soil following burning is popularly known as "Sowing on the burn." Forest land is ringbarked and during the summer a running fire destroys the undergrowth and debris. In the autumn following the burning operation the seed is broadcast at the rate of from 2 to 4 lbs. per acre accompanied by an application of from 1 to 2 cwts. of superphosphate. The fertiliser and seed may be mixed immediately before broadcasting, and this method assists in the even distribution of seed. This is an admirable method of clearing the country in such areas if followed by grazing, and brings about a gradual disappearance of the scrub partly through the smothering effect which the clover has upon the young scrub shoots, and partly through the trampling and grazing of stock which consume a large amount of "roughage" in conjunction with the clover. This procedure can produce a stand of clover in the first season almost equal to that of cultivated land.

Sowing in cultivated land may be done with a without a cover crop. With a cover crop seed is sown at the rate of from 2 to 4 lbs. per acre, but if a cover crop is not sown, a heavier application of seed is advisable in order to produce a better stand during the first season. Seed should preferably be broadcasted, and only lightly covered with soil. If drilled there is a danger of planting the seed too deep. Fertiliser is applied at the same rate as for sowing on the burn.

2. *Early strains.*—These are grown in the areas of lighter rainfall where the season is shorter than in the wetter areas of the South-West. The clover is sown with a crop, usually with oats, and should not be sown through a drill with the grain and fertiliser, since this tends to bury the seed too deeply. It is best broadcasted at the rate of 2 to 4 lbs. per acre with the advent of the reliable winter rains. If sown without a crop a heavier sowing is advantageous.

Management.

Once Subterranean Clover is established it will increase and be spread by stock ingesting the burrs and passing some of the seeds in their droppings, especially on top-dressed pastures. Both cattle and sheep spread the clover readily in this way, and, in addition, the burrs are caught up in the wool of sheep and further distributed. This may account for the appearance of the plant in districts where it was previously unknown. Stock, apart from carrying the plants from paddock to paddock, may also carry it into the bush, and in this way, in certain areas, quite useful stands of the clover have been established with the aid of phosphatic manure. The clover should be permitted to make an appreciable growth before admitting stock—the lateral stems should be developed before this is done. If the crop is to be cut for hay, heavy winter grazing should not be permitted, especially in the districts of lighter rainfall. The plant has the ability of making a fair amount of growth during the cold weather, but it produces most of its bulk during the warm spring months.

When the crop is to be cut for hay or silage, this should be done as early as is compatible with obtaining a reasonable yield. Only a proportion of the burrs should be formed at this stage. With advancing maturity there is a definite decrease in the nutritive value of the clover, both the protein and phosphorus contents being considerably reduced. In older pastures containing a large percentage of adventitious grasses and weeds, such as Wild Geranium (*Erodium*), it is probably preferable to cut for silage. By this method the grasses and weeds which usually mature before the clover, and which would be quite innutritious as hay, may become of value owing to the changes taking place in the silo. Further, this method will help to reduce the number of weeds in the pasture in the subsequent year.

In the areas without summer rains, clover allowed to remain on the surface will cure into hay of a fair quality quite suitable for feeding sheep or dry stock. Where a good covering of clover has been secured, a scarifier run over the land in summer will bring to the surface a large number of the seed burrs, which are readily eaten by sheep. These being of high feeding value will be of great benefit in supplementing the low protein diet usually available to sheep during the summer months, the subsequent stand of clover not being impaired.

For the successful maintenance of Subterranean Clover, an annual application of soluble phosphate is essential. Superphosphate should be applied at the rate of 1 to 2 cwts. per acre during the autumn as soon as possible following the first rains. In districts which have a longer growing season, where a good regrowth may be expected after hay cutting, it is often advisable to apply a supplementary dressing of about 1 cwt. of superphosphate per acre in the spring.

After Subterranean Clover has been grown continuously for a number of years, a condition known as "clover-sickness" develops. This is accompanied by the ingress of a number of annual weeds, especially the poorer grasses. At this stage in the wetter areas the land should be ploughed, and cropped with oats, maize, or potatoes, thereby utilising the nitrogen accumulated during the years of clover pasture. In the following season the land should be allowed to revert to clover, when a good stand will be procured without reseeding. Alternatively, the clover may be ploughed up, for the introduction of perennial grasses and clovers. In the areas of lighter rainfall, when "clover-sickness" becomes evident, the land should be utilised for alternate fallowing and cropping for several seasons. The land may be re-seeded with clover for pasture when deemed advisable.

Dodder and Insect Pests.

Almost everywhere where Subterranean Clover is cultivated, Dodder is present to a greater or less extent. Much of its introduction is due to the former practice of establishing the clover through sowing infected clover burr. Dodder is a leafless parasite that feeds upon the stems and leaves of the clover, and has no connection with the soil. It forms small entanglements which become conspicuous during the months of September and October when the white blossoms, which grow in dense clusters, become evident in affected spots. These spots may be isolated patches of a few feet in diameter, or where unchecked they may become mor or less general throughout the pasture. It is important that the plant should be prevented from seeding. This may be done by cutting out the affected areas when they first come into flower, cutting as close as possible to the ground with a scythe. and either feeding the hay so obtained to stock, or, if there is any danger of some of the dodder plants having reached the seeding stage, the cut material should be burned. In such cases, feeding the hay to stock only spreads the weed, since the seeds are readily passed by stock in a viable condition. It is equally important in establishing the clover to obtain clean seed.

Where a crop is affected generally, the best plan is to cut for hay or silage at an early stage, before there is any chance of the seed having set. Where the weed is allowed to seed unchecked, it may spread to such an extent that the pasture become practically useless, and constitutes a menace, since Dodder spreads rapidly by means of its seeds.

Clover Springtail (Lucerne Flea) and Red-legged Earth Mite have only become serious pests during recent years. While both these pests, if present, will attack new sowings of Subterranean Clover, their ravages are usually most apparent in the older established pastures. In fact, they are generally seen at their worst when the pastures are showing signs of clover-sickness, and when a large amount of decaying organic matter is present in the surface layers of the soil, or upon the surface. Two management methods have proved fairly successful in combating the Clover Springtail and to some extent the Red-legged Earth Mite.

With the advent of warm dry weather, the Clover Springtail deposits a number of resistant summer eggs. If the clover is ploughed in, and with it the Clover Springtail, before this period, the insect may be smothered and to a great extent controlled during the following season. However, as the worst effects are usually noticed in clover-sick fields, it is probably advisable to follow ploughing by a season's cropping before allowing the field to revert to pasture. The new vigorous stand of clover thereafter obtained should be relatively free from these pests for a few years.

Burning a pest-infested field during the summer also meets with some measure of success. It is essential, however, that the field be not grazed too heavily before

burning, in order that an even and complete burn may be secured. A fast-running fire is of little use, since many of the crevices in which the eggs are deposited will remain unaffected by the heat. A good creeping fire which may be secured by burning back against the wind, will destroy large numbers of the eggs, without damaging the burrs, and a clean stand should result in the following season.

A Clover Springtail parasite (*Biscirus lapidarius*), a predatory mite which feeds upon the Clover Springtail itself, has recently been discovered. It is hoped that with the increase and distribution of this mite, the Springtail may assume less serious proportions in the future.

FIELD EXPERIMENTS WITH WHEAT AND OATS, 1932.

WONGAN HILLS LIGHT LANDS FARM.

I. THOMAS, Superintendent of Wheat Farms.
A. R. VENTON, Farm Manager.

The following table shows the rainfall as recorded at the farm during the past two years and also the averages as recorded at the town of Wongan Hills, four miles distant, over the nineteen years previous to 1932:—

Year.	Growing Period.													Total for year.
	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Total.	Nov.	Dec.	
1932 ...	50	13	119	95	292	134	393	554	76	178	1,627	6	24	1,934
1931 ...	...	9	6	101	209	174	265	174	143	73	1,038	...	137	1,291
Av. 19 yrs.	34	51	87	66	198	282	272	193	128	92	1.165	37	58	1,498

The season opened fairly well, there being sufficient rain early in April to germinate many weeds and give the early sown wheat and oats a good start. From then on, until the latter part of May, there was sufficient warm weather to enable weeds to be dealt with. Late in May moderately heavy rains fell. Many frosts were experienced from June onwards, with exceedingly heavy rains in July and August. The exceptionally wet and cold conditions which prevailed are generally considered to be very unfavourable for this class of country, but excepting on the low lying and undrained flats, also on some of the deep sandy patches, the crop did not appear to be affected very much. In August and September the low-lying portions of the crop were very badly waterlogged, and were very poor indeed, being far below the remainder in general appearance. However, with warmer and drier conditions, a fairly good recovery was made at the end of October, and during November, although these portions did not equal the rest of the crop, being shorter and the ears much smaller.

The September rains were below the average, but excellent rains fell in October. The late rains were particularly helpful to those varieties which were sown after the middle of May and had not made much growth before wet and cold conditions prevailed.

The land on which the various experiments were carried out is a tussocky type of sandplain on a low-lying flat.

It was fallowed in June-July, 1931, with disc cultivating ploughs, and crossed with the same implements in August-September. In March 1932, it was disced to deal with suckers. Before seeding early in May, it was disced with the tandem disc and spring tyne cultivated. These operations left a good seed-bed besides dealing with weeds.

Time of Planting Experiment.

This experiment is being conducted to determine the most suitable month for planting the wheat crop in this district.

The early maturing variety, Gluyas Early, and the midseason-maturing variety, Nabawa, were used, the former being planted in mid-May, June, and July, and the latter in April, May, and June.

The April sown plots germinated and stooled well, and were robust throughout the season. The May sown plots also germinated well, but stooling was not so good, neither was growth so vigorous until October, when the general appearance improved considerably. The June and July sown plots were slow in germinating, and made little headway until October. The unusually wet and cold conditions obviously handicapped the late sown plots of both varieties.

TIME OF PLANTING EXPERIMENT.

Variety—Nabawa. Seed—45lbs. per acre. 22 % Superphosphate—120lbs. per acre.

Planted.	Computed Yields per Acre.				Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1928–32.	Percentage Yields, 1928–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
April 15th	20 24	17 20	19 4	17 52	18 40	155	16 54	112
May 15th	12 24	11 12	12 48	11 52	12 4	100	15 10	100
June 15th	7 28	7 28	8 24	7 4	7 34	63	8 43	58

Section 5 discarded owing to interference by waterlogging.

TIME OF PLANTING EXPERIMENT.

Variety—Gluyas Early. Seed—45lbs. per acre. 22 % Superphosphate—120lbs per acre.

Planted.	Computed Yields per Acre.				Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1928–32.	Percentage Yields, 1928–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
June 16th	9 52	11 36	8 40	8 32	9 40	65	10 5	66
May 16th	16 56	14 8	14 8	14 8	14 50	100	15 14	100
July 15th	2 40	2 48	3 28	2 32	2 52	19	5 39	37

Section 5 discarded owing to interference by waterlogging.

The results again confirm those of former years, viz., it is essential for seeding operations to be completed by the end of May.

Rate of Seeding Experiment, Wheat.

As was the case in previous years, the experiment was conducted with two varieties, Nabawa (midseason maturing) representing the free stooling, and S.H.J. (early maturing) representing the sparse stooling types respectively.

Germination and growth was good with both varieties. Early in the season the light sowing appeared somewhat sparse, more particularly with the sparse stooling variety S.H.J., but as the season advanced this became less apparent.

At maturity, the ears of both varieties were noticeably small on the plots receiving the heavy rate of seed.

RATE OF SEEDING EXPERIMENT.

Planted April 29th, 1932. Variety—Nabawa. 22 % Superphosphate—120lbs. per acre.

Rate of Seed.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1925–32.	Percentage Yields, 1925–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.		bus. lb.	
60lbs.	20 32	19 20	19 52	19 44	17 44	19 26	105	16 14	103
45lbs.	19 20	19 4	19 4	18 40	16 32	18 32	100	15 45	100
90lbs.	19 28	20 0	20 16	18 0	17 52	19 7	103	16 7	102

RATE OF SEEDING EXPERIMENT.

Planted May 17th, 1932. Variety—S.H.J. 22 % Superphosphate—120lbs. per acre.

Rate of Seed.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1925–32.	Percentage Yields, 1925–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
60lbs.	17 28	18 0	19 20	19 12	19 12	18 38	101	13 28	103
45lbs.	17 12	17 44	19 4	18 56	19 12	18 26	100	13 5	100
90lbs.	18 32	19 52	20 24	20 0	19 44	19 42	107	13 50	106

Although this year's results are in favour of the heavier rates of seeding, more particularly with the sparse stooling varieties, the average results indicate that no appreciable advantage is gained by sowing over 45 lbs. of seed per acre.

Seasonal Planting Experiment.

The objects of the experiment are:—

1. To ascertain the most suitable month to plant the late, midseason, and early maturing varieties of wheat.
2. To determine the most prolific of each of the above types.

To meet the requirements of the experiment three seections were planted, viz.:—

(a) Section 1, planted in April, representing early planting;

(b) Section 2, planted in May, representing midseason planting;

(c) Section 3, planted in June, representing late planting.

Each section, planted in its respective month, was repeated five time, all plots being eventually harvested for grain.

The April sown plots germinated well, and were healthy throughout the season. The two early varieties gradually drew ahead and the two late varieties fell behind, particularly Sutton. There was little difference at any time between Nabawa and Bencubbin, any difference being in favour of Nabawa until spring. The variety Sutton did not grow so fast as Yandilla King until late spring. It then grew very rapidly indeed, and was considerably taller than the Yandilla King at maturity.

The two early varieties were obviously planted too early, and were in ear before the end of August.

The May sown plots germinated well, but made very little growth until spring, when growth was fairly rapid. There was very little difference between the plots until maturity, excepting that the two late varieties were obviously sown too late.

The June sown plots germinated rather slowly and irregularly. Growth was very slow indeed until spring, when all plots improved rapidly, and at maturity were only a little shorter in the straw than the May sown plots.

SEASONAL PLANTING EXPERIMENT.

APRIL PLANTING.

22 % Superphosphate—120lbs. per acre. Seed—45lbs. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yields per acre.		Percentage Yields.	Percentage Yields, 1928–32.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Yandilla King ...	Late ...	10	56	13	20	16	56	12	48	14	56	13	47	120	106
Nabawa ...	Midseason ...	9	12	10	48	11	20	12	0	14	0	11	28	100	100
Sutton	Late ...	10	16	16	24	12	0	12	16	16	16	13	26	117	117*
Bencubbin ...	Midseason ...	11	4	18	16	13	44	13	20	16	24	14	34	118	123†
Nabawa ...	Midseason ...	9	36	15	20	11	52	12	8	12	48	12	21	100	100
Gluyas Early ...	Early ...	10	56	12	32	10	40	11	44	11	44	11	31	93	95
Totadgin ...	Early ...	11	36	11	36	10	40	13	28	13	28	12	10	95	‡
Nabawa ...	Midseason ...	13	12	14	0	11	12	10	16	15	4	12	45	100	100

* 1931–32. † 1930–32. ‡ Planted 1932 only.

SEASONAL PLANTING EXPERIMENT.

MAY PLANTING.

22 % Superphosphate—120lbs. per acre. Seed—45lbs. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yields per acre.		Percentage Yields.	Percentage Yields, 1928–32.
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Yandilla King ...	Late ...	10	56	7	12	8	0	15	4	14	56	11	14	72	88
Nabawa ...	Midseason ...	13	4	11	26	13	20	20	16	19	28	15	33	100	100
Sutton	Late ...	9	28	10	0	13	20	18	16	16	32	13	31	87	91*
Bencubbin ...	Midseason ...	14	0	13	12	16	48	22	16	20	16	17	18	114	114†
Nabawa ...	Midseason ...	12	0	11	12	15	20	18	32	18	40	15	9	100	100
Carrabin ...	Early ...	11	4	12	8	15	20	17	4	17	28	14	37	96	97
S.H.J.	Early ...	12	24	11	36	14	48	15	52	17	20	14	24	95	88
Nabawa ...	Midseason ...	12	32	10	16	15	12	19	12	18	16	15	6	100	100
Merredin ...	Early ...	11	28	9	4	14	24	16	32	13	12	12	56	86	87
Gluyas Early ...	Early ...	12	40	9	44	14	48	16	24	15	20	13	47	88	98
Nabawa ...	Midseason ...	13	28	9	36	13	0	19	12	18	24	15	44	100	100
Totadgin ...	Early ...	11	36	9	52	13	36	15	52	15	52	13	22	85	‡
Geeralying ...	Early ...	12	8	9	36	14	8	13	36	13	12	12	32	82	81
Nabawa ...	Midseason ...	12	24	10	0	19	44	16	40	17	20	15	14	100	100
Noongaar ...	Very early ...	10	32	8	8	13	4	12	32	15	44	12	0	79	65

* 1930–32. † 1931–32. ‡ Planted 1932 only.

SEASONAL PLANTING EXPERIMENT.

JUNE PLANTING.

22 % Superphosphate—120lbs. per acre. Seed—45lbs. per acre.

Variety.	Maturity.	Computed Yields per Acre.										Average Yields per acre.		Percentage Yields.	Percentage Yields, 1928–32
		Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.					
		bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	%
Geeralying ...	Early ...	9	12	11	52	8	48	10	32	11	4	10	18	76	79*
Nabawa ...	Midseason ...	12	56	14	24	12	32	12	56	15	4	13	34	100	100
Bencubbin ...	Midseason ...	15	20	14	24	13	4	15	36	14	48	14	38	108	114†
Carrabin ...	Early ...	13	44	13	44	13	20	16	0	14	48	14	19	86	86
Nabawa ...	Midseason ...	16	0	16	48	15	44	17	44	17	28	16	45	100	100
S.H.J.	Early ...	16	8	14	8	14	0	16	32	14	56	15	9	91	84
Gluyas Early ...	Early ...	16	16	14	0	13	28	15	44	16	24	15	10	90	91
Nabawa ...	Midseason ...	17	12	17	4	15	44	17	12	16	56	16	50	100	100
Totadgin ...	Early ...	14	24	14	40	13	28	13	4	15	4	14	8	84	‡
Merredin ...	Early ...	17	4	15	20	15	28	16	0	16	32	16	5	94	89†
Nabawa ...	Midseason ...	18	48	17	12	16	8	17	52	15	52	17	10	100	100
Noongaar ...	Very Early...	14	24	15	20	18	32	16	56	12	56	15	38	91	78

* 1929–32. † 1930–32. ‡ Planted 1932 only.

These results demonstrate the suitability of late maturing varieties for early planting during April and midseason varieties for later planting on this class of soil.

Rate of Superphosphate Experiment.

The object of this experiment is to determine the most profitable amount of superphosphate to apply to the wheat crop.

Two sections, of 15 plots each, were planted. In No. 1 section the rates of superphosphate were 150 lbs., 225 lbs., and 300 lbs. per acre, and in No. 2, 75 lbs., 150 lbs., and no super, each being repeated five times.

Germination throughout the experiment was farily even, and growth robust, except where no superphosphate and 75 lbs. were used. The two latter each showed the effects of the excessive wet, but were considerably better than in former years, probably due to the residual effect of the superphosphate applied four years perviously.

There was little, if any, difference between the three heavy dressings at any time, growth and general appearance being excellent.

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on May 4th, 1932. Variety—Nabawa. Seed—45lbs. per acre.

Rate of 22 % Superphosphate.	Computed Yields per Acre.										Average Yields per acre.		Percentage Yields.	Average Yields per acre, 1929–32.		Percentage Yields, 1929–32.
	Sec. 1.		Sec. 2.		Sec. 3.		Sec. 4.		Sec. 5.							
	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	bus.	lb.	%	bus.	lb.	%
300lbs.	20	48	19	4	18	56	20	24	20	40	19	58	98	17	9	106
150lbs.	20	32	20	8	20	16	19	52	21	12	20	24	100	16	12	100
225lbs.	20	32	20	56	20	16	21	44	20	24	20	46	102	17	6	106

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Planted on May 4th, 1932. Variety—Nabawa. Seed—45lbs. per acre

Rate of 22 % Superphosphate.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre. 1929-32.	Percentage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Nil	11 52	13 12	13 20	11 44	13 4	12 38	56	3 10	20
150lbs.	22 0	22 24	23 44	22 56	22 32	22 44	100	15 36	100
75lbs.	19 44	20 24	22 8	20 32	21 12	20 48	91	12 26	80

This year's results confirm those of former years, viz., that it is advantageous to apply considerably more than 75 lbs. of superphosphate on this class of land. Even at present low prices for wheat, an application of at least 120 lbs. per acre is warranted.

Potash Experiment.

The object of this experiment is to determine whether any advantage is derived from supplementing the application of superphosphate, with a potassic manure, for growing a wheat crop on light land.

Three fertilisers were used, and were applied as follows:—

Plot 1. 150 lbs. superphosphate plus 56 lbs. muriate of potash p.a.
Plot 2. 150 lbs. superphosphate (control).
Plot 3. 150 lbs. superphosphate plus 140 lbs. kainit per acre.

Germination and growth were fairly good throughout the experiment. There was no difference between plots at any time throughout the season, and at maturity the whole experiment was even and attractive.

POTASH EXPERIMENT.

Planted on 3rd May, 1932. Variety—Nabawa. 22 % Superphosphate—150lbs. per acre. Seed—45lbs. per acre.

Potash applied per Acre	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre. 1927–32.	Percentage Yields. 1927–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Muriate of Potash, 56lbs.	22 8	21 28	20 32	20 16	21 12	21 7	95	16 40	98
No Potash	23 12	22 56	21 4	22 32	20 56	22 8	100	17 2	100
Kainit, 140lbs. ...	21 36	21 36	21 20	22 8	20 32	21 26	97	16 48	99

The results this year confirm those of former years, viz., yields are not increased by applying a potassic fertiliser to this class of soil.

Rhenania Phosphate Experiment.

The object of this experiment is to determine the value of Rhenania Phosphate for wheat growing as compared with superphosphate.

The usual three-plot system was used, and repeated five times.

No. 1 plot received 150 lbs. rhenania phosphate per acre.
No. 2 plot received 150 lbs. superphosphate per acre.
No 3 plot received 110 lbs. rhenania phosphate per care.

Germination was fairly good throughout the experiment, but as the season advanced the plots receiving rhenania phosphate fell behind the controls.

RHENANIA PHOSPHATE EXPERIMENT.

Planted on 5th May, 1932. Variety—Nabawa. Seed—45lbs. per acre.

Rate of Application of Phosphate per Acre.	Computed Yields per Acre.			Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1930-32.	Percentage Yields, 1930-32.
	Sec. 1.	Sec. 2.	Sec. 3.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
150lbs. Rhenania Phosphate	15 4	17 44	18 40	17 9	85	14 13	75
150lbs. Superphosphate	17 12	19 44	23 36	20 11	100	18 58	100
110lbs. Rhenania Phosphate	14 48	14 56	17 44	15 49	78	12 50	68

Sections 4 and 5 discarded owing to interference by waterlogging.

These results confirm those of former years, viz., rhenania phosphate does not equal superphosphate as a means of supplying the wheat plant's requirements of phosphate.

Potash Nitrogen Experiment.

The object of this experiment is to determine the effect upon the wheat crop of—

(a) a nitrogenous fertiliser;

(b) a nitrogenous + a potassic fertiliser.

All plots received a dressing of 120 lbs. superphosphate per acre. No. 1 plot received, in addition, 1 cwt. sulphate of ammonia per acre, and No. 3 received the same dressing of sulphate of ammonia plus 56 lbs. of muriate of potash.

Germination was good and growth robust throughout the season. During the early part of the season the control plots were apparently not equal to the others, but late in the season the difference became less marked. At maturity the difference in favour of the plots receiving the sulphate of ammonia and muriate of potash was not very marked. Also there was no appreciable difference between the two sets of plots receiving the special fertilisers.

POTASH NITROGEN EXPERIMENT.

Planted on 4th May, 1932. Variety—Nabawa. 22 % Superphosphate—120lbs. per acre. Seed—45lbs. per acre.

Rate of Application of Fertiliser per Acre.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
112lbs. Sulphate of Ammonia; 120lbs. Superphosphate	17 20	15 28	16 56	17 36	17 44	17 1	114
120lbs. Superphosphate	15 20	13 36	13 36	15 12	17 4	14 58	100
112lbs. Sulphate Ammonia; 56lbs. Muriate Potash; 120lbs. Superphosphate	18 32	15 12	16 16	17 28	18 24	17 10	115

Whilst these results are for one year only, and therefore cannot be regarded as conclusive, they show that increased yields can be expected by a heavy application of a nitrogenous fertiliser, but there is no further increase in yield when a potassic fertiliser is also used. The gain in yield, however, does not warrant the additional cost of special fertiliser.

Rate of Seeding Experiment—Oats.

As was the case for the rate of seeding with wheat, this was planted with a free and also a sparse stooling variety, Algerian representing the former and Burt's Early the latter.

Germination was satisfactory with both varieties, and throughout the season the growth was good. The light sowing was rather sparse in each case, but this became less apparent as the season advanced.

At maturity the light sowing of Burt's appeared rather thin and the straw coarse.

RATE OF SEEDING EXPERIMENT—OATS.

Planted on April 29th, 1932. Variety—Algerian. 22 % Superphosphate—120lbs. per acre.

Rate of Seed.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1926–32.	Percentage Yields, 1926–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
45lbs.	15 16	14 24	13 32	15 32	14 16	14 32	102	14 14	108
30lbs.	16 8	13 8	14 0	15 16	13 32	14 21	100	13 11	100
60lbs.	14 24	14 24	16 24	15 32	15 16	15 16	106	14 28	111

RATE OF SEEDING EXPERIMENT—OATS.

Planted on May 2nd, 1932. Variety—Burt's Early. 22 % Superphosphate—120lbs. per acre.

Rate of Seed.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1926–32.	Percentage Yields, 1926–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	
45lbs.	26 8	26 32	27 32	22 24	25 8	25 29	102	15 28	102
30lbs.	25 24	27 16	21 8	22 32	28 32	25 6	100	15 14	100
60lbs.	25 32	29 16	25 8	22 32	27 8	26 3	104	16 3	105

With both varieties the heaviest rate of seeding appears to advantage, but the average results over a number of years indicate that no appreciable advantage is gained by sowing over 45 lbs. of seed per acre.

PASTURE NURSERY PLOTS.

G. K. BARON-HAY,
Superintendent of Dairying.

H. G. ELLIOTT,
Agricultural Adviser.

Following on promising results obtained in single rows with a number of pasture plants of a perennial habit, it was thought desirable that farmers should be familiarised with these plants and be given an opportunity of obtaining seed if they should prove of economic value in their particular locality. With this object in view, therefore, a number of pasture nursery plots throughout the South-West were initiated, the Department of Agriculture acting in close co-operation with Cuming Smith & Mt. Lyell Farmers' Fertilisers, Ltd., who supplied the necessary fertiliser and assisted in supervision. The South-West portion of the State was divided into zones shown in the attached map, corresponding approximately with the zones in force for the Better Dairying Competition, and a brief resume is given below of the results in each zone.

Area—3/20ths of an acre, consisting of three plots each 1/20th acre in extent.

Cultivation.—Land ploughed and cultivated so as to form a consolidated seed bed with a fine even tilth to obtain an even germination, which is absolutely essential for success, the working of the land after germination of weed seeds being necessary prior to sowing the pasture seeds.

Seed.—The area of 3/20th acre was divided into three plots and sown as follows:—

(a)	Western Districts Perennial Rye Grass ..	20 lb. per acre
	New Zealand White Clover	2 lb. „
(b)	Akaroa Cocksfoot	20 lb. „
	New Zealand White Clover	2 lb. „
(c)	Phalaris tuberosa	10 lb. „
	New Zealand White Clover	2 lb. „

Fertiliser.—All plots were fertilised with superphosphate and ammonia No. 3 at the rate of 300 lb. per acre.

Sowing.—This was carried out immediately after the advent of the first general rains.

The seed and fertiliser were forwarded to the various farmers participating during the first week in April, and in the majority of cases were sown before the end of April.

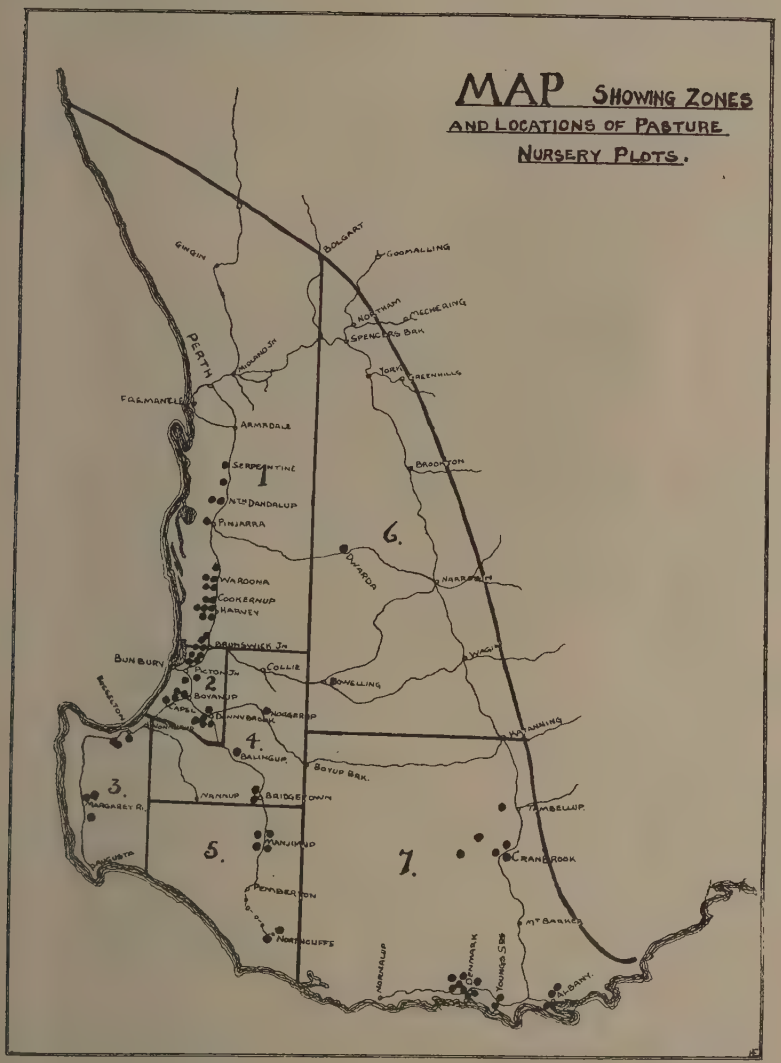
Throughout the year visits were made to the various centres for the purpose of inspection, and the results to date are given below:—

Zone 1. Rainfall 30—40 inches. Centre—*Waroona.*

In this zone there were 20 trial plots established on various classes of soil and under different conditions.

Germination.—On all sites the germination was excellent. The perennial rye grass from the beginning gave the best results, being followed by cocksfoot and *Phalaris tuberosa.* On the heavy classes of soil it was noticeable that the *Phalaris tuberosa* was growing much better than on the lighter types. White clover was

not successful on most plots, owing to the severity of the ravages of lucerne flea and red mite, but, where these pests were absent, or only limited, it grew and appears to be doing well.



Map showing zones and location.

Zone 2. Rainfall 40 inches. Centre—*Burekup.*

There were 18 plots established in this zone on a wide range of soils. As was the case in Zone 1, germination on nearly all the plots was excellent, but, on account of the severe check due to weed and insect infestation, all plots suffered more

or less. It, however, was noticeable that, with the grasses during the first season, the rye grass was the most promising, and in nearly every case the white clover failed owing to the effects of the red mite and lucerne flea.

The *Phalaris tuberosa* and cocksfoot made very slow growth in the earlier part of the season, but later the *Phalaris* was showing promise of being successful. It, however, remains to be seen which will be the most successful on the second year's trial.

Zone 3. Rainfall 30—40 inches. Centre—*Margaret River.*

In this zone only five plots were established, and from the results obtained the majority of them suffered severely from weed infestation, but the grasses generally were doing well, particularly the perennial rye grass and cocksfoot. White clover did not make any headway, being badly affected with red mite and lucerne flea.

Zone 4. Rainfall 30 inches. Centre—*Preston Valley.*

There were five plots established in this zone, the majority of which were free from weed infestation. Of the grasses the *Phalaris tuberosa* and cocksfoot were showing up better than the rye grass. The white clover in every case was a failure owing to the ravages of the pests, lucerne flea and red mite.

Zone 5. Rainfall 30—40 inches. Centre—*Manjimup.*

Of the five plots established in this zone, three gave very good results with white clover; the other two were failures. Of the grasses, the rye grass was most outstanding, followed by cocksfoot. The *Phalaris tuberosa* was not successful, this probably being due to the climatic conditions, as in every case germination was excellent but subsequent growth practically nil.

Zone 6. Rainfall 20—30 inches. Centre—*Narrogin.*

Only two plots were established in this zone, and the rye grass was the most successful, followed by the *Phalaris tuberosa.* In both cases the white clover failed.

Zone 7. Rainfall 20—40 inches. Centre—*Denmark.*

Seventeen plots were established throughout this zone, which has a wide variation in rainfall.

In the extreme southern coastal portion of this zone, which has 40 or over inches of rain per annum, the rye grass and cocksfoot were doing well, but the *Phalaris tuberosa* was more or less a failure, this being due probably to the extreme cold and wet conditions. The white clover was doing fairly well on most plots.

In the lower rainfall portion of the zone, the rye grass and *Phalaris tuberosa* were most outstanding, and in some places good stands of white clover have been obtained.

General.

The majority of the plots were sown on old pasture land without sufficient fallowing or cleaning to free it from weeds, consequently many of the experiments were in a very weedy condition, which made the competition too severe for the perennial plants, which are generally slower to come away after initial germination.

Insufficiency of preparation of the soil, combined with inadequate drainage and too deep planting of the seeds, all helped in retarding the natural development of a number of plots.

The white clover used in the mixture germinated well, but was severely checked and even completely killed in the early stages of growth on the majority of the plots by the severity of attack of both lucerne flea and red mite. Successful establishment of this clover was only obtained on those plots which were free or comparatively free from infestation of the above pests.

On the first year of trial, the perennial rye grass was undoubtedly the most promising, and, with the exception of the extreme southern portions of the State, the *Phalaris tuberosa* appeared to be established and no doubt will give good results next season. The cocksfoot has given fairly good results in all zones, with the exception, perhaps, of Zone 6, which has a lower rainfall and more severe summer conditions.

Further reports will be published at the conclusion of the second year's observations.

DROOPING-FLOWERED CLOVER

(*Trifolium cernuum*, Brot.).

T. C. Dunne and C. A. Gardner.

Drooping-flowered Clover is so named from the ultimately reflexed position of the individual flowers in the head, especially when in pod. Like most of our naturalised clovers, it is native to Southern Europe, especially Spain and the southern parts of France. Although such an important constituent of wet pastures in Western Australia, it is not so well known elsewhere, and although the clover is now finding favour in the east, practically the entire seed production for Australia comes from Western Australia. The specific name *cernuum* is from *cernuus*, a Latin word meaning "nodding" and referring to the hanging flowers of the species.

The clover is closely related to Cluster clover, but can readily be distinguished by its hollow stems, the reflexed flowers, and the presence of a long slender flower-stalk, whereas Cluster clover has compacted flower heads with no evident flower-stalk. Both clovers have pink flowers and small yellow seeds.

We are ignorant of the date that this clover appeared in Western Australia, also the circumstances of its appearance. There is little doubt its introduction, like so many other valuable plants, was accidental, and that while it has not made so much progress in the other States of Australia in which it is also naturalised, it found a fitting environment in the moist lands of South-Western Australia.

The species has been known to occur in Western Australia for over 20 years, and was first noticed by the late Mr. W. C. Grasby, who knew it in the Gingin district as "Gingin clover."

Description of Plant.

A hairless annual herb, with diffuse or ascending hollow stems, usually trailing for a length of from 12 to 20 inches, but frequently so dense in wet situations that it forms thick masses of up to 18 inches in height. Leaves on long slender leaf-stalks, elliptical or obovate-cuneate, thin and tender, minutely toothed, strongly veined, the stipules lanceolate, acute. Flower-stalks long and slender, bearing a head of small numerous flowers on short and thin pedicels. Calyx open at the throat, 10-nerved, erect or spreading when in flower, but drooping after flowering. Corolla pale pink, small. Standard notched at the apex, not much longer than the

calyx. Pod included in the calyx, 2-3-seeded. Seeds small, 1.3mm. long by about 1mm. wide, pale yellow, not lustrous, ovoid or sub-triangular-ovoid with a prominent radicle.

Drooping-flowered Clover has become one of the most important clovers in the wetter portions of the State. Like Subterranean Clover it makes a good stand on virgin soil, but it will thrive in situations which are not sufficiently well drained for Subterranean Clover. Under suitable conditions it is at least as prolific as Subterranean Clover, has less coarse stems, and is probably more palatable to stock. Moreover it shows considerable resistance to the ravages of Clover Springtail and Red-legged Earth Mite—two pests which have played such havoc in many established pastures of Subterranean Clover.

Chemical analyses show that the clover is highly nutritious, and similar to Subterranean Clover in composition. On top-dressed areas young pastures give values as high as 28 per cent. protein, and over 1.0 per cent. phosphorus, calculated on the weight of dried material. The composition of hay will vary from 12-18 per cent. protein, and .5-.8 per cent. phosphorus, depending upon the time of cutting.

Distribution.

Drooping-flowered Clover will grow in a wide range of soil types, the limiting factors being lack of available soil moisture, and perhaps an excessive degree of acidity, which arrests the development of nitrogen-fixing bacteria. In soils which are moderately acid it succeeds better than Subterranean Clover. Available soil moisture is the principal requirement for this species. It prefers moist, or even wet situations, and is capable of withstanding long periods of inundation—at least three or four weeks. For this reason it is suitable for cultivation in the wettest soils of the South-West, such as periodic swamps, or land which retains its moisture until well into the late spring. The species is now naturalised as far north as Watheroo, and as far east as Kellerberrin and Quairading in moist situations. It is principally cultivated in the areas of the lower South-West southwards from Serpentine to the Vasse and Denmark districts, and also at Gingin.

Establishment and Seed.

Like Subterranean Clover, Drooping-flowered Clover may be successfully established on partially cleared virgin soil following a burn. Clean seed may be sown at the rate of 1-2 lbs. per acre with an application of from 1 to 2 cwts. of superphosphate. As with Subterranean Clover, the growth procured during the first year is usually poor, but with the multiplication of necessary bacteria, and of seed, a good stand is soon obtained.

This clover produces a very high percentage of hard seeds which do not germinate during the first season. A number of samples, tested from the 1931-1932 harvest averaged 6.0 per cent. germination, with a minimum of less than 1.0 per cent., and samples from the 1932-33 harvest have averaged about 2.0 per cent. It has been shown that by a scarifying process the germination of these seeds can be raised to 30 per cent. and, in some cases, 40 per cent. Since it is possible for all seed to be treated, farmers are urged to insist upon scarified seed for future sowings. This treatment is now being carried out by the Department of Agriculture.

Seed may be obtained by collecting matured clover before the seeds have been shed, and chaffing. This material may be put into bags for spreading on new areas. A cornsack of such "chaff" usually contains about 5 lbs. of seed. The method is not recommended where it can be avoided, since it helps to spread insect pests such as Red-legged Earth Mite and Clover Springtail.

DROOPING-FLOWERED CLOVER

(*Trifolium cernuum*, Brot.).

Explanation of Plate.

A.—Portion of Plant (half natural size) showing ascending habit.
B.—Leaf (natural size).
C.—Flowering head (natural size).
D.—Fruiting head (natural size).
E.—Flower × 4.
F.—Fruiting calyx × 4.
G.—Seeds × 4.

The clover sheds its seeds freely, and when the pods have opened, the seed lies on the ground forming a yellow covering to the soil. It is thus easily swept up, and may be cleaned.

A third method, employed by Messrs. Reading Brothers of the Vasse with considerable success, is the utilisation of cow droppings for sowing new areas. Droppings from cows fed on hay of this clover are collected from the yards and heaped. The fermentation of the heap acts on the hard seeds bringing about a high percentage germination. These droppings are spread over new land from a dray at the rate of about two loads per acre and a good stand is procured. By this method the necessary bacteria are probably also introduced.

Clean seed is obtained by cutting, chaffing and threshing.

Manuring.

At the time of sowing, superphosphate should be applied at the rate of from 1 to 2 cwts. per acre. This should be followed by a similar application each year after the first rains. A further dressing of 1 cwt. per acre during the spring is often advisable to procure maximum growth. Although the species thrives under moderately acid soil conditions, there are indications that an application of lime may make the clover more palatable to stock.

Management.

Drooping-flowered Clover may be grazed, or cut for hay or silage. As with Subterranean Clover it is best to cut early, since the protein and phosphorus contents fall rapidly with maturity. The best time is probably about the period of flowering. In the areas south of Bunbury it is often possible to secure two cuts per season—an early cut for silage, and a later cut for hay. Where this is proposed, the spring top-dressing with superphosphate should be particularly valuable.

After a few years of vigorous growth, clover sickness becomes apparent, and there is an increase in the poorer annual grass species. In such cases it is advisable to plough the soil for cropping (*e.g.*, oats, maize, peas, or potatoes). The area can during the following year be allowed to revert to pasture when a good stand of clover will be produced. In suitable areas ploughing may be followed by the introduction of perennial species of grasses and clovers for which the soil will have been well prepared by the annual clover.

POINTS IN PURCHASING SEEDS.

G. R. W. MEADLY, B.Sc., Agricultural Adviser.

Of all the purchases which a farmer is required to make, agricultural seeds probably show the largest range of variation in value. When we consider that they are also one of the most expensive recurring purchases, there is little need to stress the fact that great care must be taken when buying them. Cheap seeds are practically always unsatisfactory, but unfortunately the converse does not apply, and often an expensive line is actually of inferior quality. Although an indication of the quality may be obtained by an examination of the physical properties of the seeds, buying on general appearance alone certainly cannot be recommended. The only satisfactory method of deciding comparative values of seeds, and their suitability for agricultural purposes, is by a complete test of purity and germination.

Seeds imperfectly ripened frequently show the fact by wrinkled coats, lack of plumpness, and evidence of a green tinge, particularly in legumes. Variation in colour may be brought baout by a number of external factors. Dampness causes bleaching and mouldiness; bright and shiny seeds generally become dull with age; harvesting when unripe and storing before dry, or in moist places is usually associated with a darkening of the seeds and the presence of moulds. Less frequently an indication may be obtained by means of the smell, a mustiness suggesting dampness and growth of moulds.

In the case of a number of pasture grasses, *e.g.*, rye grass, cocksfoot, paspalum, where the actual seed remains enclosed within glumes, the bushel weight provides information regarding the value of the seed. Although an inferior grade of seed may be detected by making use of the foregoing facts, lines which do not show any of the incriminating features may still be of inferior quality. As stated before, the only means of detecting these lines is by making a test for purity and germination capacity.

When buying seeds a number of factors must be considered:—

(1) Genuineness.
(2) Suitability for district and soil conditions.
(3) Freedom from and resistance to disease.
(4) Place of origin.
(5) Purity.
(6) Germination.
(7) Quality.

A number of cases have come under my notice of seeds being sold under incorrect names. Until a few years ago this was probably the rule rather than the exception, with Toowoomba Canary Grass (*Phalaris tuberosa*) and Lotus Major (*L. uliginosus*). These are both perennials, which were largely replaced by inferior annuals, *Phalaris minor* and *Lotus hispidus* and *L. angustissimus* respectively. When one considers the discrepancy in value between the seed purported to be sold and that which was actually delivered, the need for care in this direction becomes evident. A more difficult position arises when strains are involved, for then in only very few cases is it possible to ascertain from the seed whether it is true to name. In such cases the farmer's only protection is the reliability of his seed merchant.

The suitability of the species or strain for the district and soil conditions should be given ample consideration; certain clovers and grasses thrive where others will merely exist or fail entirely, and many pasture plants have been condemned in a district owing to unsatisfactory results being produced by planting on unsuitable types of soils. Examples of two closely related species which give good results under very dissimilar conditions are Lotus major (*L. uliginosus*) and *L. corniculatus*. Whereas the former is more or less restricted to soils which retain considerable moisture close to the surface during the summer months, the latter produces summer growth under comparatively dry conditions. The recognition of strains within species is rapidly becoming of more importance, and the New Zealand system of certifying a number of these, such as Akaroa Cocksfoot, Hawke's Bay Perennial Rye Grass, and New Zealand White Clover, has done a lot for the general improvement of pastures. Although this Government certified seed is more expensive than ordinary lines, the increased production, palatability, and permanence, usually soon outweighs the difference in original outlay.

One of the many tasks which confront plant breeders is to evolve and fix strains which are disease resistant. This is more important in cereals than in fodder and pasture plants, and a considerable amount of work has been done in this State to produce and perpetuate strains of wheat which are resistant to diseases, particularly of fungal origin, such as "Rust" and "Flag Smut," *e.g.*, Nabawa for "Rust," and Nabawa, S.H.J., Bencubbin, Totadgin, Geeralying, etc., for "Flag Smut." Every advantage should be taken of the information which has been accumulated to obtain suitable but disease-resistant varieties, and at the same time endeavour to secure seed which is not infected either internally or superficially with disease growths, particularly fungi. Vegetable seeds, especially beans, peas, tomatoes, cabbages, and melons are likely to carry infection, and the fungus (*Peronospora sp.*) which causes the Downy Mildew of tobacco is also seed borne. Seed of Rye, Rye Grasses, and to a lesser extent a few other members of the grass family, sometimes contain black elongated bodies which are known as ergots. These are the resting bodies of a fungus, *Claviceps purpurea*, which take the place of some of the grains in the fruiting spikes. These ergots are poisonous, and the importation of any seed containing them is prohibited under the Commonwealth Quarantine Regulations.

When possible it is advisable to secure seed which has been grown under climatic and soil conditions similar to those prevailing where it is to be sown. Locally grown seed of good quality and strain is better adapted to local conditions than most seed which may be imported, and the matter of acclimatisation makes the origin of seed question worthy of consideration when buying.

Purity is one of the most important factors to be considered. The fitness of any sample for sowing depends primarily on the character and number of the foreign or extraneous seeds that it contains. If these foreign seeds are those of plants which will in any way seriously affect the crop that is to be grown, the sample must be considered quite unfit for the farmer to use. Weed seeds, besides giving rise to plants which will cause a reduction of the crop, may also affect the production capacity of the land for years, or even permanently reduce its value for agricultural purposes. An essential part of a seed analysis is the determination of the amount and kind of the weed seeds present, and the declaration of those which are noxious.

Besides extraneous seeds, commercial lines contain other impurities to a greater or lesser extent. These include broken and shrivelled seeds incapable of producing normal seedlings, stones and sand, empty glumes, or so-called husks, in the case of grasses, sticks and other organic matter. Although not so important as the seed impurities, this material is being paid for at the same rate as the seed desired, and is consequently a direct loss.

The other important factor which determines the fitness for sowing is the capacity and rate of germination and growth. A single satisfactory figure for all seeds cannot be suggested, owing to the large variation between such for different species. It is inadvisable to buy cheaply a low germinating line, for this feature is usually associated with low vigour. These defects, however, can be partially corrected by heavy sowings, whereas a line containing noxious weed seeds is a menace under any circumstances.

An unusual feature associated with certain seeds is their inability to germinate readily immediately after harvesting. This is particularly marked in the case of Paspalum (*Paspalum dilatatum*), the seeds of which appear to require a resting period prior to germination.

Many plants of the Pea family (*Papilionaceae*) produce a certain percentage of so-called "hard seeds." These seeds will not readily absorb water and ger-

minate, but remain hard for an indefinite period. Although of value under certain conditions for ensuring the permanence of a stand, for the first year of sowing a high hard seed content is usually a disadvantage. Locally the main plants producing this type of seed in any quantity are:—Subterranean Clover, Drooping Flowered Clover, Lupins, and Tangier Pea.

For the last few seasons Drooping Flowered Clover seed especially has contained a particularly high percentage of "hard seeds," averaging over 90 per cent. By means of a scarifying process, the germination of this small seeded clover has been increased considerably and for the current season, at least, all Drooping Flowered Clover seed should be treated before sowing.

The quality of seed includes such features as size and evenness. Large seeds usually give rise to vigorous and healthy plants, and, when considering such species as Subterranean Clover, usually contain a lower percentage of "hard seeds" than the smaller seeded lines. Plumpness and the absence of shrivelling are also factors which must be considered. The grading of seed to produce a uniform sample is of importance for, besides considerably improving the appearance of the line, the resulting crop is of a more even nature.

Farmers, generally speaking, should take more advantage of the Agricultural Seeds Act, a clause of which allows a purchaser to demand the purity, germination, and weed content of any line exposed for sale. Owing to the fact that often figures are given which are so low for purity and germination to be of no value at all, the following table is given as an indication of the figures for good lines of various agricultural seeds:—

Name of Seed.	Purity by weight.	*Weed Seeds not to exceed.	Germination.	Hard Seeds not to exceed.	†Actual Value.
	%	%	%		%
Cocksfoot	90	0·2	80	...	72
Paspalum	75	...	45	...	34
Timothy	98	0·5	88	...	86
Sudan Grass	98	0·5	88	...	86
Yorkshire Fog	80	2·5	50	...	40
Italian Rye Grass M/D ...	98	1·0	85	...	81
Perennial Rye Grass M/D	98	1·0	80	...	78
Wimmera Rye Grass M/D	96	1·0	88	...	84
Rape	99	...	96	...	95
Rib Grass	83	5·0	60	...	49
Medicago denticulata ...	90	0·5	65	A 5	60·5
Lucerne	98	0·1	88	A 7	88·0
Peas	98	...	98	...	96·0
Lotus corniculatus ...	99	...	90	B 3	90·0
L. hispidus	97	0·5	75	B 12	77·0
L. uliginosus (L. major) ...	90	1·5	85	B 8	79·0
Berseem Clover	99	...	95	A 2	95·0
Drooping Flowered Clover	85	5·0	35‡	B 65	45·0
Suckling Clover	90	2·0	65	B 25	66·0
Cluster Clover	86	3·0	30	B 60	43·0
Alsike Clover	97	0·5	90	A 8	89·5
Crimson Clover	99	...	80	B 2	80·0
Red Clover	99	0·5	88	B 7	90·5
White Clover	97	1·5	88	A 6	87·0
Subterranean Clover ...	98	0·8	75	B 15	81·0

* Weed seeds exclude other farm seeds. † Proportion of Hard Seeds included in Actual Value in the case of legumes, viz., half where Hard Seed figure preceded by A, a third where Hard Seed figure preceded by B. ‡ Figure which should be obtained by scarification.

The actual value is a very important figure and should be used when purchasing. It is derived by multiplying the purity figure by the germination figure and dividing by 100. One-half the "hard seeds" of large seeded legumes and one-third "hard seeds" of small seeded ones is added to the germination figure before this calculation is made.

After obtaining figures from the seed merchant it is advisable, before purchasing, to submit a sample of the seed to the Agricultural Department, where it will be tested for a small charge (rates shown below). A farmer has no redress after delivery has been accepted by him, and legal action can only be taken in respect of seeds, samples of which have been taken in the presence of the vendor, or his agent, by an officer of the Department.

Every farmer should avoid cheap seed, unless definitely proved of quality. Seeds bought at a low price usually prove an expensive purchase before good results are obtained, consequently buy to a standard and thus obtain good seed.

Tests are carried out by the Botanical Branch, Department of Agriculture, at the following charges:—

Purity, 5s.

Germination, 2s. 6d.

Purity and germination, 6s.

AN INEXPENSIVE WHEAT PICKLER.

By A. B. Adams. B.Sc. Agr.

An inexpensive but satisfactory pickler for pickling wheat with dry copper carbonate can be made by any handy man from an old petrol drum (40 gals.), one length of sawn jarrah 6 ft. x 4 in. x 4 in., and a length of round timber about 12 ft. x 9in. in diameter.

First, square holes, 4 inches on the sides, are cut in each end of the drum, as close to the edge as possible, but on opposite sides so that the 4 by 4 jarrah will pass diagonally through the drum, so giving it an eccentric motion when revolved.

Then another opening, about six inches on the sides, is cut on the side of the drum, as close to the end as possible, but at the opposite side of the end to the opening cut for the axle. If to make this opening, two diagonal cuts are made thus, the angular sections can be bent upwards and slightly outwards so leaving a square opening with a triangular section at each side. The triangular sections act as supports for a small filling hopper or funnel bolted or riveted to them. The funnel is made by riveting together four pieces of flat iron, say 7 inches wide at the bottom, 10 inches wide at the top by 8 inches deep; the extra inch is overlap or riveting. Then rivet or bolt the funnel to the turned up triangular pieces placing it inside them.

Pass the 4 x 4 through the drum but leave more exposed of the end to which the handle is to be fixed. It is better for the axle to be a tight fit.

Put a diagonal saw cut through the centre of the 12ft. x 9in. round and cut a half circle about 4in. in diameter in the bevelled end left by the saw cut in each section of round timber.

Place the round timber in holes sunk at a sufficient distance apart to allow the drum to revolve freely between them, with the cut surface of the bevels at the upper ends facing outwards. Now round off the end of the axle that projects the least and round off the other end in the right position to fit the support. Make any suitable handle and attach to the end of the axle with the greatest projection from the drum. Mount the drum on the supports.

Such a pickler will pickle about 2 bushels at a time; it will hold more than this but turning is difficult.

The way in which the drum is swung allows it to be emptied rapidly and completely; this is made easier by bolting small hook bolts to the drum to support a bag when emptying.

The diagram should make the description easier to follow.

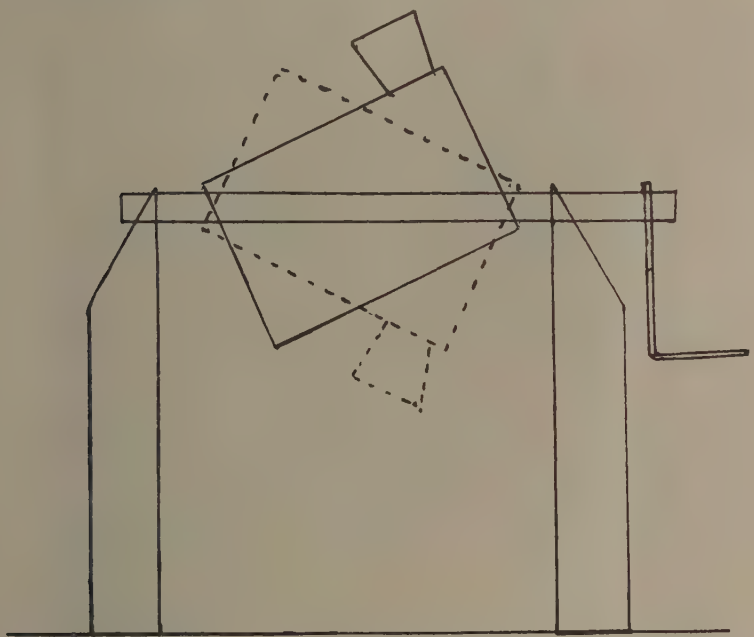


Diagram of Pickler made from old petrol drum. Solid lines show the filling, and dotted lines the emptying, position.

PEA WEEVIL

(*Bruchus pisorum*). ××, 582.

A Warning.

By L. J. Newman, Government Entomologist.

In view of the rapid spread of the Pea Weevil, it is thought necessary to issue a further warning to growers and sellers of pea seed.

An appeal is being made to all concerned to co-operate in the necessary action for the suppression of this very destructive field pest.

Its control is not difficult, and those areas now free can be protected against its introduction.

A few careless growers or sellers of infested seed can be the medium of the rapid spread of this weevil.

It therefore behoves all growers to carefully examine the seed before buying, and, if indications of the presence of the weevil are found, to refuse purchase.

As a further precaution it would be wise to fumigate the seed.

A brief description of the various stages of the insect, together with remedial measures, is herein given.

If requiring fuller information, write for Leaflet No. 357.

Description of adult beetle: Black in colour, covered with a dense coating of fine brown hairs variegated with small patches of black and white hairs that form **black and white spots on the thorax and wing covers.**

The eggs: The adults appear in the crops in the spring and frequent the flowers and young pea pods. Their oval yellow eggs are laid on the exterior of the green pods. They hatch in about 16 to 21 days according to climatic conditions prevailing

The lava: The newly hatched larva or grub has six short feeble legs. It burrows straight down into the pod, boring a neat round hole into the developing young pea. Here the grub lives and grows. By the time the peas are ripe the larva is about one-sixteenth of an inch long and safely lodged in the interior of the pea. The completed larval stage, from the time of entering the pea to the pupal stage, takes about three months. Before pupating within the pea the grub eats away the substances of the pea at one end, leaving a circular semi-transparent mark which is typical of the presence of this weevil in the seed. Seeds showing **this indication should be destroyed.**

Pupa: This is the stage between the full-grown larva and adult beetle. This stage lasts for about three weeks to a month, when the adult beetle appears. These adults remain lodged inside the peas for an indefinite period, most of them remaining dormant until the following spring, when they issue to carry on the propagation of their species. There may be a partial second generation. Fortunately this weevil cannot propagate in the dry-stored peas, as do the true grain weevils in dry-stored wheat.

They do not do serious damage to the foliage or flowers, their destructive **depredations being confined to the peas.**

Some of the beetles do issue during January and February, but these hide away under suitable shelter until about July or August, when the main issue begin to come forth.

Remedial Measures.—It was only during last year that the Pea Weevil was recorded as a field pest in Western Australia. It is evident that the trouble has been introduced per medium of weevil-infested seed. It is by this means that it is spread from place to place. The beetles can fly well, but do not appear to travel **long distances, being more or less local in their distribution.**

The first line of attack is obvious, namely, to see that only weevil-free seed is used for sowing. The peas should be gathered as soon as possible after they are ready for stripping or threshing, and at once treated with some approved method for the destruction of the young developing larvae or grubs that may be present **in the peas.**

When the peas are just ripe, the grubs inside them are very small and have done little harm. If kept for a month the grubs will have greatly increased in size and eaten out large cavities in the peas. If kept for two months after **being gathered, without treatment, the grubs will have matured, resulting in only the outer shell of the pea being left.**

This species of Bruchidae cannot reproduce in dry peas as do the wheat weevils in wheat. Peas picked for use in the green do not suffer.

For the control of this pest the following suggestions are given:—

1. All peas kept for seed or dry food to be fumigated with carbon-di-sulphide as soon as gathered.
2. Sow crop as early as possible, so as to get peas off in the early spring.
3. Harvest the crop as much on the green side as is safe, rather than is usually done now, when they are left to get dead ripe.
4. The harvesting of the seed on the green side renders the pea straw of a much higher quality for food—the seed is heavier and its germinating powers are not affected.
5. Sow the next pea crop as far away from last year's as possible. In other words, practise rotation of crops.
6. A good purpose is served by allowing pigs to run in an infested field after taking off the crop. They will pick up the peas that have shed, including the infested ones.
7. Infested land should be thoroughly ploughed, seeing that the land is well turned over.
8. The fumigant recommended is carbon-di-sulphide. It must be applied as soon as the seed is gathered. The infesting grubs are then very small, and if at once killed their early presence in the peas is of little consequence. The seed should be placed in a gas-tight space, say a drum, tank, or room. The fumigant is used at the rate of 4 lb. to 1,000 cub. ft. of space, or, if used in a drum or tank, 1 fluid oz. (two tablespoonfuls) to every 200 lb. of seed.

The liquid may be poured on to pieces of old bagging or into shallow plates. The period of fumigation should not be less than 48 hours. The tops of drums or tanks may be covered with several wet bags to keep the gas from escaping.

In using the carbon-di-sulphide all naked lights must be kept away, as it is explosive and inflammable. Do not enter any room so fumigated until same has been thoroughly ventilated and all traces of the gas have disappeared. With ordinary care and intelligent application, this fumigant is perfectly safe to use.

The recommendations herewith, if carried out thoroughly, will control this weevil.

RELATIVE FOOD VALUES.

For the benefit of those farmers who find it necessary to purchase concentrated foodstuffs for their stock, the following table has been prepared showing the relative value of common supplements at current market rates:—

Relative Value of Concentrates—March, 1933.

Foodstuff.	Cost.	Cost per 100lbs.	Starch Equivalent per 100lbs.	Digestible Protein per 100lbs	Cost per lb. of Starch Equivalent.	Cost per lb. of Digestible Protein.
		s. d.			d.	d.
Wheat	2s. 9d. per bushel of 60lbs. ...	4 7	72	9·0	0·76	6·1
Oats	1s. 9d. per bushel of 40lbs. ...	4 4½	60	7·0	0·88	7·5
Bran	£5 17s. 6d. per ton	5 3	50	9·0	1·26	7·0
Linseed Meal ...	14s. 6d. per 100lbs.	14 6	76	26·0	2·29	6·7
Meat Meal ...	7s. 9d. per bag of 50lbs. ...	15 6	90	60·0	2·07	3·1
Peas	5s. per bushel of 60lbs. ...	8 4	72	17·0	1·19	9·5

THE FERTILISER TRIALS AT HERDSMAN LAKE.

By J. C. Palmer, Potato Inspector.

A series of fertiliser trials was devised to ascertain the manure suitable for the growing of potatoes on the reclaimed land of Herdsman Lake. This reclaimed area is a calcareous clay. The surface is moist but solid, very dark grey in colour and contains numerous small shells of the Gasteropod type. The soil in general seemed to be composed of organic matter of a rubbery consistency, which possibly contains large amounts of partially decomposed cellulose and undigested matter. The experimental area, approximately 1 acre, was ploughed into lands and drainage channels provided for watering by seepage. Delaware seed was used. Flat cultivation was followed, this being the general practice in the culture of all summer grown crops.

The plots were planted on 17-18th October, 1932, and were dug from 19-20th January, 1933.

The weather during the earlier part of the growing period of the potatoes was favourable with some rain, which caused the potatoes to make rapid and vigorous growth. However, the latter end of the period was not so favourable, for there were many hot days accompanied with dry easterly winds. At this stage the Rutherglen Bug (*Nysius vinitor*) was very active, which probably caused a marked lowering of yield in the resultant crop. Also this season the Potato Moth (*Phthorimaea operculella*) was very prevalent throughout the potato crops of the metropolitan area, and the experimental plots did not escape infestation from the ravages of this pest. Further, on the east side there were some indications of second growth, which seemed to prove that the watering had not been so regularly sustained as it might have been—a condition noted by Mr. Morgan, Senior Potato Inspector, on one of his visits, and certain suggestions were made by him to correct this, and to mitigate the damage being caused by insects to the crop.

Plots of 6/200 acre (approximately 1/33 acre) were used to demonstrate the different manurial treatments, so that soil variation might be overcome. These plots were sub-divided into 6 sub-plots, each of which was 1/200 acre. The weighings from each sub-plot were taken, and from these six weighings the Standard Experimental Error (Eggleton and Yule) was calculated. The totals of the six weighings were taken as the completed plot yields, and are the totals shown in the tables, which follow subsequently in this report.

Set 1.

To determine whether a complete manure (4 cwt. sulphate of ammonia, 12 cwt. super, 2 cwt. sulphate of potash) is better than—

(a) no manure;

(b) super alone.

Table 1.

Standard Error of Experiment—4·88 lbs. per 1/200 acre plot.

Treatment in tons per acre.	Yield in lbs. per 6/200 acre.	Per cent.	Calculated yield in tons and cwts. per acre.
0-0-0	367	58	5-9
4-12-2	639	100	9-9
0-12-0	567	89	8-8

These figures show that—

(a) a complete manure is better than no manure;

(b) a complete manure is probably better than super alone.

Set 3.

To determine whether it is better to use a complete manure than—

(a) super and sulphate of ammonia;

(b) super and sulphate of potash.

Table 2.

Standard Error of Experiment—5·21 lbs., per 1/200 acre plot.

Treatment in tons per acre.	Yield in lbs. per 6/200 acre.	Per cent.	Calculated yield in tons and cwts. per acre.
4–12–0	713	101	10–12
4–12–2	709	100	10–10
0–12–2	576	81	8–11

These figures show that—

(a) no apparent difference between complete manure and one of 4-12 0;

(b) complete manure better than one of 0-12-2.

Set 4.

To determine whether it is better to use 0-4-12 cwts. of super plus sulphate of ammonia and sulphate of potash—

Table 3.

Standard Error of Experiment—8·51 lbs. per 1/200 acre plot.

Treatment in tons per acre.	Yield in lbs. per 6/200 acre.	Per cent.	Calculated yield in tons and cwts. per acre.
4–0–2	320	44	4–14
4–12–2	710	100	10–10
4–4–2	565	79	8–8

These figures show that—

(a) a complete manure is better than a mixture of 4-0-2;

(b) a complete manure is better than a mixture of 4-4-2.

Set 6.

To determine whether it is better to use 2-4-6 cwts. of sulphate of ammonia per acre—

Table 4.

Standard Error of Experiment—4·53 lbs. per 1/200 acre plot.

Treatment in tons per acre.	Yield in lbs. per 6/200 acre.	Per cent.	Calculated yield in tons and cwts. per acre.
2–12–2	657	99	9–15
4–12–2	664	100	9–17
6–12–2	630	96	9–3

These figures show that there is no real apparent difference between using 2-4-6 cwts. of sulphate of ammonia per acre.

BLUESTONE TRIALS.

An experiment was also made to test the advantage of using gypsum and a mixture of gypsum and bluestone; these products added to a complete manure against the complete fertiliser alone—

TABLE 5.

Standard Error of Experiment—4·37 lbs. per 1/200 acre plot.

Treatment in lbs. per acre.	Yield in lbs. per 6/200 acre.	Per cent.	Calculated yield in tons and cwts. per acre.
4–12–2 + 56lbs. gypsum	674	99	10–0
4–12–2	681	100	10–2
4–12–2 + 56lbs. gypsum + 14lbs. bluestone ...	733	108	10–18

These figures suggest that no benefit was derived by adding gypsum to a complete manure, but that the addition of 14 lbs. of bluestone to the complete manure and the gypsum gave an increased yield.

CONCLUSIONS.

1. The most satisfactory fertiliser from these experiments on virgin soil at Denmark Lake (a grey calcareous clay) consists in a mixture of ammonium sulphate and superphosphate. A mixture of 2 cwt. of sulphate of ammonia and 12 cwt. of super seems to be the most economical.

2. Use of potassic fertilisers in the complete manure 4-12-2 did not influence the yield as compared with super and sulphate of ammonia.

3. In absence of sulphate of ammonia the sulphate of potash caused a significant depression of yield as compared with a complete manure. This may be due to some physical effect of the manure on the young plants.

4. Copper sulphate in addition to the complete manure gave an increased yield, which may be significant.

5. Scab was prevalent throughout the plots.

BRANDING THE WOOL BALES.

By H. McCARTHY, Sheep and Wool Inspector, and W. McC. JOHNSON, Cadet.

Wool correctly described and the bales neatly branded are essential to give buyers confidence in the clips catalogued.

A general inspection of the wool displayed by the brokers reveals many instances of deplorable carelessness on the part of the wool-growers.

The bale should be clearly and distinctly branded with—

1. The name of the property or owner's initials.
2. The letters denoting the description of the contents, and
3. The bale number.

Complicated wool-brands, especially those which contain characters or shapes not easily decipherable, entail extra work at the Wool Stores. The use of horse and cattle brands on the bales are not necessary, and often the bales show too many brands.

For neat and accurate branding a well-cut stencil is essential. These can be made on the farm, or purchased at a small cost. Uniformity in branding the bales should be aimed for, and the appearance of the clip on the floors is greatly enhanced if the marks on each bale correspond with regard to placing and spacing. Many clips seen on the floors show very irregular and untidy branding of the bales, stencils not having been used, and in some instances the marks are even put on with charcoal.

The use of stencils made for fruit cases in unsatisfactory, as the resulting brands are too small for the wool bales.

Apart from a pleasing appearance, well-branded bales have a most important value. Buyers who find a clip suitable to their requirements and true to the description on the bale will record that particular clip and look out for it in future sales, thus establishing a ready market for the wool of the careful grower.

The departmental Bulletin, No. 154, gives full information regarding correct branding and is very clearly illustrated.

MAIZE FERTILISER TRIALS—1932-33.

G. K. Baron-Hay,
Superintendent of Dairying.

A number of fertiliser trials were carried out throughout the South-West during the season 1932-33, the cost being borne jointly by Cuming, Smith and Mt. Lyell Farmers' Fertilisers, Ltd., and the Department of Agriculture. The object of the experiments was to provide information regarding the most economical fertilisers to use for the growing of maize, the soils chosen in each case being those representative of the district.

The fertilisers used were—

1. Superphosphate 4 cwts. per acre.
2. Superphosphate 4 cwts. per acre + Sulph. ammonia 2 cwts. per acre.
3. Superphosphate 4 cwts. per acre + Sulph. ammonia 2 cwts. per acre. + Sulph. potash 1 cwt. per acre.
4. Superphosphate 4 cwts. per acre + Sulph. potash 1 cwt. per acre.

Each plot was 1/8 acre and each treatment replicated three times for the purpose of accuracy, taking into consideration any variation in soil conditions.

A. J. Kemp, Wonnerup:

At Wonnerup a trial was conducted by Dairy Instructor Giles on the property of Mr. Kemp.

Soil.—The type selected was a grey sandy loam originally timbered with red gum and jarrah, badly drained, and not previously cropped.

Preparation.—The land was ploughed with a disc and harrowed in the autumn. This was cross-ploughed to a depth of four inches at the time of seeding.

Method of Sowing.—The fertiliser was applied in every third furrow and covered lightly with soil prior to seeding.

Depth of Seeding.—Approximately three inches.

Rate of Seeding.—28 lbs. per acre.

Cultivation after Seeding.—Plot twice harrowed after planting, followed by [illegible], levelled off, and the whole again harrowed and levelled off when seeding was completed.

Variety.—"Hickory King."

Date of Seeding.—7th to 14th November.

Germination.—Fair, 75 per cent. strike.

[illegible] 2nd. November.

Distance between Rows.—24 inches.

[illegible] A. J. Kemp, Wonnerup.

Season 1933.

On New Land. *Planted* 10th November, 1932.

Plot No.	Fertiliser per acre.	Cost of Fertiliser per acre plus freight.	Average Yields per acre.	Weight of Maize per acre, less 14% Moisture.	Weight of Crop per acre, less fertiliser cost and freight.	Percentage Yield.
		£ s. d.	T. C. Q. L.	£ s. d.	£ s. d.	
1, 5, 9 (Controls)	Super.—4 cwt.	1 0 0	3 14 2 2	2 15 10	1 15 10	100
2, 6, 10	Super.—4 cwt.; Sulphate of Ammonia, 2 cwt.	2 6 2	12 6 1 8	9 4 8	6 18 6	380
3, 7, 11	Super.—4 cwt.; Sulphate of Ammonia, 2 cwt.; Sulphate of Potash, 1 cwt.	3 7 7	13 1 1 22	9 16 1	6 [illegible] 8	381
4, 8, 12	Super.—4 cwt.; Sulphate of Potash, 1 cwt.	2 1 5	7 2 2 12	5 6 11	3 5 6	191

NOTE.—Fertiliser freight—Picton to Wonnerup = 6d. per cwt.

Superphosphate	...	at £4 10s.	per ton.
Sulphate of Ammonia	...	at £12 12s.	"
Sulphate of Potash	...	at £20 18s. 6d.	"

Weights were taken on 3rd February, 94 days after seeding. All plots were in full tassel and commencing to cob.

Average Heights—

Control—4½ ft. Drying off rapidly.

Nos. 2, 6, 10—7½-8 ft. Excellent condition, succulent.

Nos. 3, 7, 11—7½ ft. Excellent condition, succulent.

Nos. 4, 8, 12—5 ft. Colour poor, less succulent.

L. Stiles, Group 52, *Vasse Siding*:

Supervised by Dairy Instructor Giles.

Soil.—Red sandy loam originally carrying red gum and jarrah.

Drainage.—Good.

Preparation.—Plot was planted three years ago with maize, clover established over period intervening prior to preparation for trial plots. The first ploughing was carried out on September 30th to a depth of six inches, harrowed on October 15th, and reploughed to a depth of four inches on October 28th and harrowed the following day.

Method of Planting.—Drills ploughed four inches deep and 36 inches apart. Fertiliser applied in bottom of furrow and lightly covered with soil. Planting followed.

Rate of Seeding.—20 lbs. per acre.

Variety.—"Hickory King."

Date Planted.—7th to 10th November, and harrowed again on 13th November. Cultivated between rows on 10th December.

Germination.—Fair. Approximately 80 per cent.

Weights taken on 13th February, 97 days after seeding.

Results of Fertiliser Trial on Maize for Fodder with L. Stiles, Group 52, *Vasse Siding—Season* 1933.

On Sub. Clover Land. *Planted* 10*th November*, 1932.

Plot No.	Fertiliser per acre.	Cost of fertiliser per acre plus freight.	Average yield per acre.	Worth of yield per acre at 15s. per ton (Dairy Branch figure).	Worth of Crop per acre, less fertiliser and freight costs.	Percentage yield.
		£ s. d.	T. C. Q. L.	£ s. d.	£ s. d.	
1, 5, 9 (Cont. 9)	Super.—4 cwt.	1 0 6	9 3 1 15	6 17 6	5 17 0	100
2, 6, 10	Super.—4 cwt.; Sulphate of Ammonia, 2 cwt.	2 6 11	11 3 2 21	8 7 9	6 0 10	122
3, 7, 11	Super.—4 cwt.; Sulphate of Ammonia, 2 cwt.; Sulphate of Potash, 1 cwt.	3 8 5	10 10 0 20	7 17 7	4 9 2	115
4, 8, 12	Super.—4 cwt.; Sulphate of Potash, 1 cwt	2 2 0	8 9 1 10	6 7 0	4 5 0	92

Note.—Fertiliser freight—Picton to Vasse Siding = 7½d. per cwt.

Superphosphate ... ... at £4 10s. per ton.
Sulphate of Ammonia ... at £12 12s. ,,
Sulphate of Potash ... at £20 18s. 6d. ,,

This crop was permitted to dry off considerably before weights were taken. Much heavier yields might have been obtained a week earlier.

Bee Bros., Keysbrook:

Supervised by Agricultural Adviser H. G. Elliott.

Soil.—Brown sandy loam with clay underlying.

Drainage.—Fair.

Preparation.—Land was planted the two previous years with maize. The soil was prepared by spring planting. The fertiliser was applied in the furrow at planting, being covered ligthly by soil before seeding.

Germination.—Poor. 65 per cent. strike.

Distance between Rows.—32 inches.

Weights taken on 19th January.

Results of Fertiliser Trial on Maize for Fodder with Bee Bros., Keysbrook—Season 1933.

On Old Land. *Planted 8th November,* 1932.

Plot No.	Fertiliser per acre.	Cost of fertiliser per acre plus freight.	Average yield per acre.	Worth of yield per acre at 15s. per ton (Dairy Branch figure).	Worth of Crop per acre, less fertiliser and freight costs.	Percentage yield.
		£ s. d.	T. C. Q. L.	£ s. d.	£ s. d.	
1, 5, 9 (Controls)	Super.—4 cwt.	1 0 6	10 10 2 26	7 18 1	6 17 7	100
2, 6, 10	Super.—4 cwt.; Sulphate of Ammonia, 2 cwt.	2 6 11	13 10 0 13	10 2 7	7 15 8	128
3, 7, 11	Super.—4 cwt.; Sulphate of Ammonia, 2 cwt.; Sulphate of Potash, 1 cwt.	3 8 5	14 1 0 7	10 10 9	7 2 4	133
4, 8, 12	Super.—4 cwt.; Sulphate of Potash, 1 cwt.	2 2 0	12 1 1 26	9 1 1	6 19 1	115

Note.—Fertiliser freight—North Fremantle to Keysbrook = 7½d. per cwt.

Superphosphate ...	... £4 10s.	per ton.
Sulphate of Ammonia	... at £12 12s.	,,
Sulphate of Potash	... at £20 18s. 6d.	,,

This crop suffered severely from the effects of the Rutherglen bug. The general growth was very uneven owing to the variation in the soil. All plots were in the cobbing stage at time of weighing.

General Observations—

Control—Average height 5 ft. Yellow green colour.

2, 6, 10—Average height 6 ft. Green. Succulent.

3, 7, 11—Average height 6½ ft. Deep green. Succulent.

4, 8, 12—Average height 5½ ft. Slight yellow green colour.

On averaging all the plots the following figures were obtained:—

Fertiliser per acre.	Cost of fertiliser per acre, plus freight.	Average Yield per acre.	Worth of Yield per acre at 15s. per ton.	Worth of Crop per acre, less fertiliser and freight costs.	Percentage Yield.
	£ s. d.	T. C. Q. L.	£ s. d.	£ s. d.	
Superphosphate, 4 cwt. ...	1 0 4	7 16 0 24	5 17 2	4 16 8	100
Superphosphate, 4 cwt.; Sulphate of Ammonia, 2 cwt.	2 6 8	12 6 2 24	9 5 0	6 18 4	152
Superphosphate, 4 cwt.; Sulphate of Ammonia, 2 cwt.; Sulphate of Potash, 1 cwt.	3 8 2	12 10 3 16	9 8 5	6 0 0	161
Superphosphate 4 cwt.; Sulphate of Potash, 1 cwt.	2 1 10	9 4 1 26	6 18 4	4 16 6	118

The following results were obtained from the first year's experiments:—

1. A nitrogenous fertiliser in conjunction with superphosphate is essential for the purpose of growing maize successfully, and results in reduced cost of production.
2. Potash in conjunction with superphosphate or superphosphate and ammonia increases the yields, but is not economical and appears unnecessary.
3. Superphosphate alone does not give economical results, but must be used to supply phosphoric acid.
4. Superphosphate alone gives better results on old cultivated land than on new land, which is generally deficient in nitrogen.
5. Well worked and an early prepared soil is essential for maize; for preference it should be well drained and contain humus.

FIELD EXPERIMENTS WITH WHEAT AND OATS, 1932.

SALMON GUMS EXPERIMENT FARM.

I. Thomas, Superintendent of Wheat Farms.
L. G. Seinor, Farm Manager.

The following are the monthly rainfalls as recorded at the farm during 1932, together with the averages for the seven years the farm has been established.

Year.	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for Year.
					May.	June.	July.	Aug.	Sept.	Oct.	Total.			
1932 ...	49	*Nil*	90	87	78	164	144	210	79	330	1,004	26	49	1,307
Av. 7 yrs.	31	51	158	93	142	137	145	208	79	133	844	47	61	1,285

The total rainfall for the year was 1,307 points, being slightly over the average, while that for the growing period was 1,004 points, 160 points above the average for the same period.

Very little rain, however, fell early in the year. The latter half of April and almost the whole of May were unusually deficient of rain. The only falls of value registered during the month of May fell on the 29th and 31st, when 37 and 36 points respectively were recorded.

The delayed seeding rains were too late to enable the fallowed land to be planted in the desired wet condition. The germination of the early sown crops was also considerably retarded.

The rainfall from June to September was about the average but particularly heavy rains were experienced during October. These, although late, proved of considerable value, particularly to the later maturing varieties. A number of frosts were recorded during the growing period, but little or no damage to the grain occurred.

The land on which the experiments were conducted carried originally silver bark and mallee, which had been rolled down during 1926. Previous to 1932 it had grown two crops, each on fallow. During June, 1931, it was ploughed with a disc cultivating plough to a depth of 3-4 inches. It was disced two inches deep towards the end of September and again in April. The land was rigid tyne-cultivated early in May and springtyne-cultivated immediately prior to planting.

Time of Seeding Experiment.

The object of this experiment is to determine the most suitable time for planting the wheat crop. Two varieties were used, the midseason variety Nabawa being sown in mid-April, May and June, and the early variety Gluyas Early in mid-May, June and July. The results are tabulated below:—

TIME OF SEEDING EXPERIMENT.

Variety—Nabawa. Seed—45lbs. per acre. 22 % Superphosphate—112lbs. per acre.

Time of Planting.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928-32.	Percentage Yields, 1928-32
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.		bus. lb.	
April	17 44	18 16	18 16	17 20	17 52	17 28	102	15 9	105
May	16 56	17 44	17 36	17 36	17 36	17 30	100	14 23	100
June	15 36	14 40	14 40	14 8	15 44	14 58	86	9 33	66

TIME OF SEEDING EXPERIMENT.

Variety—Gluyas Early. Seed—45lbs. per acre. 22 % Superphosphate—112lbs. per acre.

Time of Planting.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1928-32.	Percentage Yields, 1928-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus lb.	bus. lb.	bus. lb.	bus. lb.		bus. lb.	
16th June	18 16	17 28	20 40	22 8	22 56	20 18	88	13 14	81
16th May	22 48	21 20	21 52	25 4	24 16	23 4	100	16 18	100
17th July	16 16	17 12	17 28	18 16	18 24	17 31	76	10 45	66

The late seeding and, in consequence, the delayed germination of the April any May plantings, have no doubt affected the results for this year, but they again demonstrate that the yields of both early and midseason varieties are considerably reduced when the crop is planted later than the month of May.

The average yields for the period the experiment has been conducted—1928-32—show that a midseason variety gives the best result when planted in April and an early variety when planted in May.

Rate of Application of Superphosphate Experiment.

For the purpose of conducting this experiment, it is divided into two sections in order to ascertain the effect of applying the following amounts of superphosphate to the wheat crop:—

Section 1—

300 lb. per acre;
150 lb. per acre (Control);
225 lb. per acre.

Section 2—

No superphosphate;
150 lb. per acre (Control);
75 lb. per acre.

The results are tabulated below:—

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Variety—Gluyas Early. Planted on 17th May, 1932. Seed—45lbs. per acre.

Rate of Application of 22 per cent. Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32.	Percentage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.		bus. lb.	
300lb.	15 36	23 44	24 40	23 52	24 24	22 27	91	17 15	100
150lb.	23 20	25 36	24 56	24 8	24 40	24 32	100	17 15	100
225lb.	23 20	24 40	23 28	23 44	24 56	24 2	98	17 40	103

RATE OF APPLICATION OF SUPERPHOSPHATE EXPERIMENT.

Variety—Gluyas Early. Planted on 17th May, 1932. Seed—45lbs. per acre.

Rate of Application of 22 per cent. Superphosphate per Acre.	Computed Yields per Acre.					Average Yields per acre, 1932.	Percentage Yields, 1932.	Average Yields per acre, 1929–32.	Percentage Yields, 1929–32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.		bus. lb.	
No Superphosphate ...	6 40	7 36	8 8	7 20	6 48	7 18	30	7 12	42
150lb.	23 36	24 0	24 40	24 8	24 24	24 10	100	17 19	100
75lb.	21 36	23 20	23 36	22 16	23 36	22 53	95	16 24	95

The results again indicate that the yields are increased when the heavier rates of superphosphate are applied. Under present economic conditions, however, the optimum rate is somewhat above 75 lb. per acre, probably in the vicinity of 100 lb.

Potash-Nitrogen Experiment.

The object of this experiment is to determine the effect upon the yield of the wheat crop by the application of—

(a) a nitrogenous fertiliser;

(b) a nitrogenous + a potassic fertiliser.

Sulphate of ammonia and muriate of potash were used and were applied to the respective plots separately a few days prior to seeding. The results obtained are given below:—

POTASH NITROGEN EXPERIMENT.

Variety—Gluyas Early. Planted on 17th May, 1932. Seed—45lbs per acre.

Rate of Application of Fertiliser per acre.	Computed Yields per acre.					Average Yields per acre.	Percentage Yields.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.		
	bus. lb	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	
112lb. Sulphate of Ammonia; 112lb. Superphosphate	22 40	23 12	23 4	23 20	23 20	23 7	98
112lb. Superphosphate	22 0	23 20	24 8	23 4	25 4	23 31	100
112lb. Sulphate of Ammonia; 112lb. Superphosphate; 56lb. Muriate of Potash	20 56	20 48	21 52	24 24	23 36	22 19	95

These results, which are for one year only and hence cannot be taken as conclusive, show that no increase in yield is obtained when either a nitrogenous fertiliser or a nitrogenous and a potassic fertiliser is applied in addition to superphosphate.

EXPERIMENTS ON "KOPI" SOILS.

Owing to the unsatisfactory crops of wheat generally obtained from the so-called "kopi" soil in the Salmon Gums area, it was decided to conduct experiments with a view to obtaining definite information regarding crop response on this class of soil.

The Salmon Gums "kopi" is described as a light-grey highly calcareous soil. It is fairly powdery and resembles grey morrel soil of the eastern wheat belt. With working, "kopi" soil tends to compact down a little.

The vegetation includes giant mallee timber, this being a variety of *Eucalyptus oleosa* and is a member of the red morrel family.

The following experiments were conducted:—

Seasonal Planting Trial with Wheat;
Seasonal Planting Trial with Oats;
Fodder Trial;
Manurial Trial.

The land on which the experiment was planted originally carried morrel, black mallee and tea-tree. It was cleared in 1924. In June, 1930, it was ploughed and the mulch was maintained throughout the year. In June, 1931, it was re-ploughed with a disc implement 3in.-4in. deep and cross-ploughed with the same implement in September. It was springtyne cultivated in October and again after rain in April.

Seasonal Planting Experiment—Wheat.

The object of this trial is to determine the most suitable time to plant the very early, early and mid-season maturing varieties of wheat.

Accordingly the standard varieties Noongaar, Gluyas Early and Nabawa were each planted in their respective plots during the months of April and May. However, owing to the scanty rainfall during April and the early part of May, the seed planted in both sections did not germinate until early June. The results obtained are shown hereunder:—

SEASONAL PLANTING EXPERIMENT—WHEAT.

APRIL PLANTING.

Planted on 25th April, 1932. Seed—45lbs. per acre. 22 % Superphosphate—112lbs. per acre.

Variety	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1931-32	Percentage Yields, 1931-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Noongaar	13 20	12 48	11 44	12 0	11 28	12 16	91	9 21	93
Nabawa	13 36	13 52	14 40	12 48	12 16	13 26	100	10 4	100
Gluyas Early	15 28	16 0	14 56	14 24	14 8	14 59	112	10 43	106

SEASONAL PLANTING EXPERIMENT—WHEAT.

MAY PLANTING.

Planted on 12th May, 1932. Seed—45lbs. per acre. 22 % Superphosphate—112lbs per acre.

Variety.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1931-32.	Percentage Yields, 1931-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Noongaar	8 48	8 16	7 12	7 28	6 56	7 44	87	6 16	89
Nabawa	9 4	9 20	10 8	8 16	7 44	8 54	100	6 59	100
Gluyas Early	10 56	11 28	10 24	9 52	9 36	10 27	117	7 37	109

These results, despite the fact that both plantings germinated at the same time, indicate the advantage of the early planting of wheat on this class of soil, even though the varieties may vary in the time of maturity.

Seasonal Planting Experiment—Oats.

The object of this experiment is to determine the most suitable month in which to plant the early, midseason and late maturing varieties of oats on this class of soil. Accordingly the standard varieties Mulga, Guyra and Algerian were each planted in their respective plots during the months of April and May.

The results obtained are shown hereunder:—

SEASONAL PLANTING EXPERIMENT—OATS.

APRIL PLANTING.

Planted on 25th April, 1932. Seed—40lbs. per acre. 22 % Superphosphate—112lbs. per acre.

Variety.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1931-32.	Percentage Yields, 1931-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Mulga	9 24	9 8	8 32	8 16	9 8	9 3	112	15 35	91
Algerian	6 32	6 16	8 0	10 16	8 32	8 3	100	17 18	100
Guyra	8 16	12 16	10 32	10 32	9 24	10 16	129	18 32	108

SEASONAL PLANTING EXPERIMENT—OATS.

MAY PLANTING.

Planted on 5th May, 1932. Seed—40lbs. per acre. 22 % Superphosphate—112lbs. per acre.

Variety.	Computed Yields per Acre.					Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1931-32.	Per centage Yields, 1931-32.
	Sec. 1.	Sec. 2.	Sec. 3.	Sec. 4.	Sec. 5.				
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%	bus. lb.	%
Mulga	12 16	12 32	14 32	11 24	13 24	13 2	152	20 10	128
Algerian	7 24	8 16	8 32	9 8	8 32	8 22	100	15 30	100
Guyra	9 24	8 16	8 32	10 32	11 8	9 30	114	17 11	110

This year's results indicate that the best yields are obtained from planting a suitable early variety during May. The average results show that a midseason maturing variety is best for April planting.

Manurial Trial.

The object of this experiment is to determine the benefit, if any, from applying fertiliser additional to the superphosphate to the wheat crop growing on "kopi" soil.

The additional fertilisers used were stable manure applied at 15 tons per acre, when the land was ploughed during the previous year, and manganese sulphate applied at 56 lbs. per acre at seeding time.

Accordingly the plots were laid out as follow:—

Plot 1.—112 lbs. superphosphate + 15 tons stable manure per acre
Plot 2.—112 lbs. superphosphate (Control).
Plot 3.—112 lbs. superphosphate + 56 lbs. managanese sulphate.

Throughout the growing period no difference could be noticed between the control plots and the plots receiving an application of manganese. There was a marked improvement in the plots receiving the application of stable manure. The results obtained are given below:—

MANURIAL TRIAL.

Planted on 12th May, 1932. Variety—Gluyas Early. 22 % Superphosphate—112lbs. per acre. Seed—45lbs. per acre.

Treatment.	Computed Yields per acre.			Average Yields per acre.	Percentage Yields.
	Section 1.	Section 2.	Section 3		
	bus. lb.	bus. lb.	bus. lb.	bus. lb.	%
15 tons Stable Manure + 112lb. Superphosphate	19 28	20 0	18 24	19 17	140
112lb. Superphosphate ...	13 20	14 24	13 36	13 47	100
56lb. Manganese Sulphate + 112lb. Superphosphate	12 16	12 32	12 0	12 16	89

Only this year's results are available and, therefore, they cannot be taken as conclusive. They indicate, however, that the application of a manganese fertiliser does not result in increased yields. A substantial increase in yield is indicated when a heavy application of stable manure in addition to superphosphate is applied to the wheat crop growing on "kopi" soil.

Fodder Trial.

The object of this trial is to ascertain the relative yields obtained from the common fodder plants when planted on "kopi" soil.

The yields of the green fodders were ascertained by taking cuttings from quadrates of one square yard in area systematically through the respective plots. The seed did not germinate until early June. The yields are shown hereunder:

FODDER TRIAL.

Planted 25th April, 1932. 22 % Superphosphate—112lbs. per acre.

Fodder.	Rate of Seed per acre.	Computed Yields per acre Green Fodder			Average Yields per acre.	Percentage Yields.	Average Yields per acre, 1931-32.	Percentage Yields 1931-32.
		Sec. 1.	Sec. 2.	Sec. 3.				
	lbs.	tons.	tons.	tons.	tons.		tons.	
Noongaar Wheat	45	1·800	1·286	1·929	1·672	61	2·164	55
Mulga Oats	40	3·085	2·572	2·572	2·743	100	3·965	100
Cape Barley	50	4·371	3·085	2·829	3·428	125	4·112	104
Rye	40	4·113	3·599	4·499	4·070	148	4·262	108
Wimmera Rye Grass	4	5·657	6·043	5·786	5·829	212	6·084	154

These results again show that the highest yields of green fodder were obtained from the Wimmera Rye Grass. Its growth in the early stages was slow, but it made excellent progress during August, September and October, attaining an average height of 22 inches. In addition, it remained green longer than the others. It is, therefore, of most value as a late green feed.

For early feed Mulga Oats, Cape Barley and Rye gave satisfactory results and indicate their suitability for early green fodder. Of the three, the rye gave the highest yield after germinating well and making excellent early growth. The Mulga oats, however, gave comparative results most consistent with those of the previous year.

The results from the wheat do not compare at all favourably with the oats, barley or rye.

PASTURE EXPERIMENT PLOTS—DENMARK STUD FARM.

G. K. Baron-Hay, Superintendent of Dairying.
H. G. Elliott, Agricultural Adviser.

Results of the Second Year's Trials with introduced Grasses and Clovers.

The results obtained from the first year's trial with Grasses and Clovers were published in the June, 1932, "Journal of Agriculture," W.A., pages 170-173.

Since the above results were published, much more information regarding the growth and habits of various strains and species have been obtained.

Legumes.—An intensive examination of the conditions was made in July, 1932, with the following results:—

Lucerne.—Five weeks prior to examination all rows were cut, and at the time of inspection the best recovery was made by the "Hunter River" variety, being closely followed by the "Spanish," "Tamworth," "Mudgee," "North Californian," "Peruvian," "Marlborough," and "South African" varieties in that order, those strains showing least recovery being the "Chinese" and "Mongolian."

All varieties were showing the severity of attack of the lucerne flea and red mite, and it can be said that the order of susceptibility, if any, is in the order of their recovery and vigour of growth.

In November, 1932, it was noticed that the "Hunter River" variety had been superseded by the "North Californian" and "Peruvian" strains, and that the "Grimm," "Mongolian," and "Chinese" were the most backward.

Further inspection in February, 1933, again indicated the superiority of the "Hunter River," as it was the most outstanding variety in the plots. The "Mongolian" and "Chinese" varieties were showing very slow and poor growth.

The second year's results still indicate that of the 20 varieties of lucerne planted the "Hunter River" is the best, being the first to come away after being severely attacked by lucerne flea and red mite and later in the year producing the best bulk of feed.

Red Clovers.—The Red Clovers were outstanding in their ability to recover after cutting. All the strains growing showed a great resistance to the attack of the lucerne flea and to a lesser extent the red mite. The "Montgomery" and "Italian" strains were the most resistant and the "Hungarian" strain the least.

The "Italian," "English Early," "English Late," and the "Montgomery" showed recovery after cutting in the order named, while the "Hungarian" strain recovered but slowly.

The next inspection revealed the fact that all of the Red Clovers were doing well and that the "Montgomery" strain would prove the most suitable type for grazing. The "Italian" variety was the best bulk producer and would make a good hay type. This type was still making the best growth when seen during the last inspection.

White Clovers.—During July these plants were suffering severely from the ravages of the lucerne flea and red mite, but despite the early attack they were all growing and producing a fair bulk of feed.

In November, however, the severe infestation by the above pests had reduced the vigour of the White Clovers so much that in many cases the rows were not discernible, and at the last inspection there were only a few odd plants which had survived.

Miscellaneous Legumes.

Lotus corniculatus.—Of all the legumes under trial, *Lotus corniculatus* appears to be the one most resistant to the attack of either the lucerne flea or red mite. Its growth at all periods of the year is good and very even, but its recovery after cutting is a little slow. There is every reason to suppose that this plant will be one of the important constituents in pasture mixtures. Unlike *Lotus major,* it can stand up to more severe drought conditions and drier soils.

Sulla. The plants in the row made very little growth during the first year, but during the winter of 1932 they made very good growth but did not recover to any extent after cutting. The plants were only slightly attacked by the red mite and do not appear to be affected by the lucerne flea.

Grasses.

Rye Grasses.—The July inspection revealed that of the three perennial types planted last year the most outstanding was the Irish strain which had recovered exceptionally well and made good growth. It, however, was followed closely by the Kentish and Tabor strains. The Italian rye grass made very irregular recovery but produced very good bulk. It is of interest that of the four rye grasses growing, the Tabor perennial strain was the only one which was attacked by the lucerne flea and red mite.

Earlier in the season further strains of rye grasses were planted. All of them germinated well, but in February only one was showing growth, and the four above varieties were very weak, only producing sparse growth.

In the adjoining paddock and elsewhere on the farm, there is what appears to be an excellent type of perennial rye grass. This will be placed under trial during the coming season.

The comparison petween the Wimmera and Italian rye grass for the district is most striking. The "Italian" produces a good bulk of leafy material and is much later to seed than the "Wimmera," which has little or no leaf, being mainly stalk and stem. The "Italian" being a biennial gives good growth for two and in some cases three years.

Cocksfoot.—During the period when lucerne flea and red mite infestation was at its peak, all strains of Cocksfoot under trial showed definite symptoms of damage from attack.

Three types of Cocksfoot are outstanding and have produced excellent growth throughout the year. Apart from tall oat grass, the cocksfoots prove to be the best type of grass to grow in these areas.

Tall Oat Grass.—This grass is a rapid grower, but during the winter and early spring months it is very severely checked by the ravages of the lucerne flea and red mite. It can be said that this grass is the worst affected grass in the whole experiment, but, as soon as the good growing period comes, it rapidly produces a large bulk of very nutritious and palatable foliage, and is one of the most outstanding grasses during the summer months.

Timothy.—All strains under test produced a fair bulk of leaf during the spring and early summer, but all are showing the effects of the present summer conditions, and it is doubtful whether they will survive the second year.

Other Grasses.

Fescue.—These are still persisting and producing a good growth of fine grass, and it is still considered that they will be valuable as a sole grass in pasture mixtures.

Wheat Grasses.—The two types tried have not produced good results, and at the present time the rows show very uneven and poor growth. It is doubtful if they will recover the second summer conditions.

Of the other grasses planted last season, good results are being obtained with *Bromus inermus*, Brome Grass, Waipu Brown Top, and Creeping Bent. The last two are fine leafed types and produce an excellent mat of green material. They are used principally as lawn grasses.

During the spring of last year three types of *Lespedeza* were planted. All varieties germinated well but have not produced much growth, being stunted and yellowish in colour. The cause of the failure this year is attributable to the lack of inoculation with suitable bacteria. It is intended to try these types again next year with inoculation, as the suitable bacterial cultures are now available.

RESULTS OF EXPERIMENTS ON SEMI-BOTTLEBRUSH AND KANGAROO GRASS FLATS, GROUP 113, NORNALUP ROAD, WEST OF DENMARK.

G. K. Baron-Hay,
Superintendent of Dairying.

A number of inquiries have been received recently by the Department regarding methods by which bottlebrush country and kangaroo grass flats may be brought into production, and in some instances recently such country has been cleared and sown with plants totally unsuited to their environment.

At the request of the Group Settlement Department a number of accurately controlled experiments were carried out, commencing in 1925, on the low-lying, generally treeless country between Denmark and Nornalup, with the object of proving its suitability for settlement, and, as no record has yet been made available regarding this type of land, it was thought that this information would now prove of value.

After an inspection of the country two sites were finally chosen, both of six acres each, on the main Denmark to Nornalup Road, Group 113. These areas represent the two types of land found in the flat country at the foot of the karri hills and jarrah rises.

Site 1.—A semi-swamp with a fall to the south, carrying mainly species of bottlebrush (*Beaufortia decussata* and *B. sparsa*) and bog myrtle (*Leptospermum firmum*).

Vegetation on semi-swamp areas treated. Owing to water-logging, root system expands into "boles," causing clearing costs to be high.

The soil is deep and sandy appearing as a loam when wet, but dries to a whitish sand in the summer. It was very fibrous in nature and slightly acid in reaction, containing much organic matter in the surface layers.

Samples of the soil were taken and analysed by the Government Analyst, the analyses indicating that the soils badly needed aeration, and to yield profitable crops would need large applications of phosphatic and potassic fertilisers, and probably a nitrogenous fertiliser, as being acid in reaction the organic nitrogen present would not be in a condition suitable for assimilation by crops. Ultimately this was found to be the case.

Clearing.—Although treeless, clearing proved to be a costly operation, owing to the branching lateral roots of the bottlebrush plants. The cost was as high as £20 per acre by man power, though no doubt this item could be reduced by the use of suitable machinery.

Drainage.—Only three acres of this block were prepared for planting, and it was effectively drained by a main drain and ploughed in narrow lanes three to the chain.

Cultivation.—During 1926 it was decided to plant an area in autumn, using different fertilisers and seed mixtures, and to reserve an equal area under fallow for planting during the autumn 1927.

In the first year it was found extremely difficult to obtain a suitable seed bed in time for planting, due to the fibrous nature of the ground. Owing to the acid reaction of the soil, poor results were to be expected.

Sowing.—This was carried out on May 10th, 1926, during fine weather. The seed and manure were broadcasted, and the land rolled twice after seeding because it was still of a very fibrous character.

Owing to fibrous nature of soil, the first ploughing is extremely cloddy. Fallowing for one season is essential.

All plots were sown with the following seed mixture:—

Lotus corniculatus	1 lb. per acre.
White Dutch Clover	1½lb. „
Alsike Clover	1 lb. „
Cow Grass	1 lb. „
Rye Grass (Perennial)	5 lb. „
Cocksfoot	5 lb. „
Paspalum dilatatum	2 lb. „
Subterranean Clover	3 lb. „
	19½lb. „

The following fertilisers were sown, each plot being in triplicate:—

1. Superphosphate 200 lb. per acre.
2. Superphosphate 200 lb. + 100 lb. muriate of potash per acre.
3. Superphosphate 200 lb. + 100 lb. sulphate of ammonia per acre.
4. Superphosphate 200 lb. + 100 lb. sulphate of ammonia.
   + 100 lb. muriate of potash per acre.

The first report was made on 28th July, 1926, and it was stated that germination on all plots was remarkably good but that the plots fertilised with sulphate of ammonia appeared more healthy.

During August and September, 1926, the plants appeared sickly, the clovers being affected first, and by the following autumn (1927) very few useful pasture plants remained.

An area was topdressed in October, 1926, with a mixture of 100 lb. superphosphate and 50 lb. sulhpate of ammonia. This gave a better growth for a while but the pasture rapidly deteriorated as the dry months approached. Lime also was applied at the rate of 1 ton per acre to one plot but, although beneficial results were obtained for a few weeks after application, the plot was no better than the rest by the end of spring 1926.

It was found, however, that on one plot which was planted with Kikuyu grass and water couch (*Paspalum distichum*) they showed promise of being useful. Couch grass (*Cynodon dactylon*) also produced fair results.

Spring Planting, 1926.—Sown in third week of October.

The following seed mixture was used throughout:—

Subterranean Clover	2 lb. per acre
White Dutch Clover	3 lb. „
Lotus major	2 lb. „
Paspalum dilatatum	12 lb. „
Rhodes Grass	4 lb. „
Couch Grass	3 lb. „
	26 lb. „

Fertiliser was planted at the following rates:—

Superphosphate	200 lb. per acre
Sulphate of ammonia	100 lb. „
Muriate of potash	100 lb. „

Results.—Germination was good throughout, but the plants did not thrive, although the soil was still moist.

Autumn, 1927.—The areas sown in the autumn and spring of 1926 were topdressed with 1 cwt. of superphosphate. A series of plots were treated with lime at the rate of 1 ton per acre, but the beneficial results obtained were only temporary.

Fallowed Land.—This was sown early in April, 1927, with the same seed and fertiliser mixtures as on the plots sown in 1926.

Here again the germination was good, but soon after the rains ceased the clovers first turned pink, and later the grasses died away, except on a few isolated spots.

Owing to financial reasons, operations ceased on this block until April, 1931, when the following experiment was conducted:—

Two acres of the above ground was ploughed, cultivated twice, and brought to a fine tilth before planting.

The seed and fertiliser were broadcasted during the first week in June.

The following basal seed mixture was used throughout the experiment:—

Lotus major	1 lb. per acre
White Dutch Clover	1½lb. „
Alsike Clover	1 lb. „
Cow Grass	1 lb. „
Italian Rye Grass	10 lb. „
Cocksfoot	3 lb. „
Paspalum dilatatum	2 lb. „
Subterranean Clover	3 lb. „
	22½lb. „

Fertiliser was planted at the following rates in duplicate:-

1. Superphosphate 200 lb. per acre.
2. Superphosphate 200 lb. + Manganese sulphate 56 lb. per acre.
3. Superphosphate 200 lb. + Sulphate of ammonia 100 lb. per acre.
4. Superphosphate 200 lb. + Nitrate of soda 100 lb. per acre.
5. Superphosphate 200 lb. + Sulphate of potash 100 lb. per acre.
6. Superphosphate 200 lb. + Sulphate of potash 100 lb.
   + Sulphate of ammonia 100 lb. per acre.

Results. A very good germination of cocksfoot and Italian rye grass was obtained, but very few of the other constituents in the pasture mixtures showed any progress.

Lime.—Across the complete experiment a strip of lime was applied at the rate of 1 ton per acre, and throughout the season the beneficial effects it had on the plants growing were noticeable, as they were stronger and more healthy with a larger portion of clovers showing than was the case in the unlimed portions.

Fertiliser. It was impossible to detect any difference in the plots from the different manurial treatments. During the summer months the major portion of the grasses were dead, the exceptions being with cocksfoot and Yorkshire fog.

It is of interest to remember that the following factors were against the experiment:—

1. Lateness of planting.
2. Extremely wet and cold winter.
3. Excessively hot and dry summer.

During 1932 it was decided to continue the experiment, sowing only those plants that had shown promise previously. The following plan was adopted:—

1. Land cross disced and harrowed. Unfortunately the use of a T. bar roller was impossible owing to the inability of obtaining one for use.

2. Seed and fertiliser were broadcasted and lightly harrowed in.

3. Seed mixture used was as follows:—

Yorkshire Fog	20 lb. per acre
Cocksfoot	10 lb. „
Drooping Flowered Clover	2 lb. „
	32 lb. „

4. Different fertiliser mixtures were sown over four plots and duplicated. The mixtures were as follow:—

1. Superphosphate 200 lb. per acre.
2. Superphosphate 200 lb. + Sulphate of ammonia 100 lb. per acre.
3. Superphosphate 200 lb. + Sulphate of potash 100 lb. per acre.
4. Superphosphate 200 lb. + Sulphate of potash 100 lb.
   + Sulphate of ammonia 100 lb. per acre.

5. Seed and fertiliser sown on 13th May, 1932.

Results. Germination of the cocksfoot and Yorkshire fog was excellent, with only a sparse germination of clover. By November the cocksfoot, Yorkshire fog, and some *Lotus major* had made excellent growth, and the majority of the ground was covered; odd patches were bare but these places were very spongy and wanted consolidation.

It was almost impossible to detect any real difference in the different fertiliser treatments.

Site 2.—Kangaroo Grass Land. Group 113, 13½ miles from Denmark.

Soil.—A light sandy loam overlying Coffee Rock at a depth varying from a few inches to several feet.

Vegetation.—Practically the only vegetation was kangaroo grass (*Themeda triandra*, Macklosys (*Anthosachne Persii*), and a few stunted jarrahs.

The soil was decidedly acid in reaction. Such soils as these, from experience gained elsewhere, give very disappointing results for the first few years due apparently to some iron compound derived from the underlying "Coffee Rock."

An analysis of the water found on such areas and made by the Government Analyst shows a high content of soluble salts and deleterious iron compounds due to a lack of drainage.

Total Soluble Salts	470.4	grains	per	gallon
Common Salt	421.4	„	„	„
Magnesium	13.3	„	„	„

Reaction: Acid.—The sample contained *ferrous iron* and smelt strongly of hydrogen sulphide. Such water is far too saline and acid for irrigating or growing any class of crop.

This area of kangaroo grass country was treated in every way similar to the semi-bottlebrush land.

The policy of leaving this and similar land in tallow for one year after first ploughed had proved economical from the point of view of expense in working down the land to a suitable tilth for planting.

Results—

Germination throughout was good, and the plants apparently thrived until the summer approached when they appeared sickly and quickly died. Similar results were obtained on both new and fallowed land.

The results at this time indicated that extreme caution should be employed in including large areas of this land for cultivation.

This land was again experimented with in 1931 and 1932 and was treated in every way similar to Site 1, Semi-Bottlebrush Country.

Results—

1931.—Seeding was delayed until October on account of the extremely wet conditions. A fair germination was obtained consisting mainly of rye grass and cocksfoot, and more clovers were noticeable than was the case on Site 1. The limed portion was no better than that unlimed, and very little, if any, difference could be detected between the various manurial treatments.

Unfortunately the dry hot summer conditions caused most of the plants to wilt, except in patches where the soil had been sufficiently consolidated.

1932. Sown in the late autumn, excellent germination being obtained, but results were not conclusive owing to the water-logging of the land due to the blocking of the drains.

Conclusions of Experiments to date—

The following points were brought out by the experiments conducted on this class of land:—

1. These soils are infertile but may be developed in conjunction with soils of better type.

2. Essential that adequate drainage be carried out prior to sowing any seeds.

3. Land should be ploughed in early winter, the sods rolled and then allowed to be fallow until following April. It should then be worked down into a reasonable tilth for seeding.

4. Germination of Italian rye grass and cocksfoot very good, but generally poor growth ensues later in the season.

5. Cocksfoot and Yorkshire fog appear more suitable to this class of soil than rye grass.

6. Germination of clovers poor, and those plants which had germinated exhibited signs attributable to soil acidity, became pink and rapidly died.

7. Treatment with one ton of lime per acre is distinctly beneficial, although this quantity does not appear sufficient to counteract acidity.

8. Yorkshire fog, cocksfoot, and *Lotus major* are easily the most successful plants among the surviving herbage. Yorkshire fog probably will give the best results for several years. This grass is stated to provide good grazing in parts of New Zealand where the land consists of peaty swamps badly drained. This approximates to the conditions on the type of land under review. It, therefore, is considered that trials with this grass are warranted.

THE ROYAL AND DISTRICT AGRICULTURAL SOCIETIES' 50-ACRE CROP COMPETITIONS, 1932.

J. Thomas,
Superintendent of Wheat Farms.

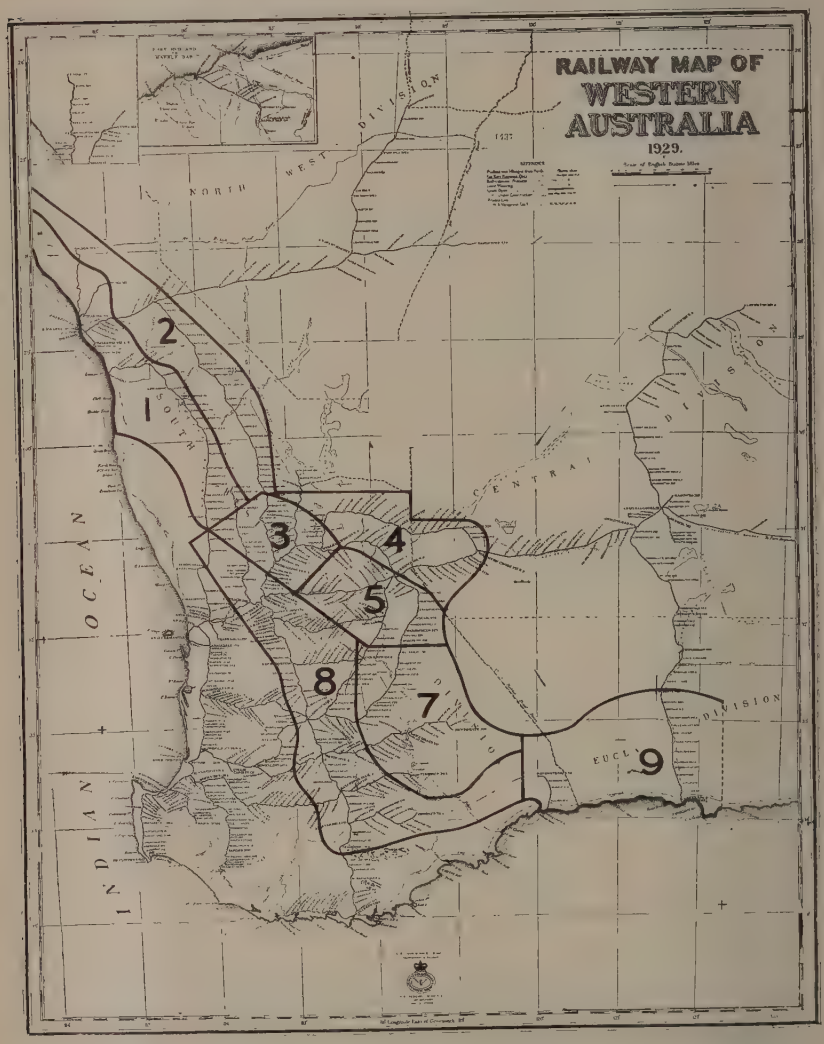
The history of these competitions has advanced a further year and there are now twelve years' results available. These give an excellent indication of the rapid improvement in general farming practice during that period and have proved that, with the application of sound methods as shown by the details of the successful entrants, a considerable improvement in average yields would result.

Considerable interest is shown in these competitions throughout the wheat belt, although more particularly so in the later settled areas. Entry is made through the competitions held by local Agricultural Societies. Where these are not held, entry is accepted direct with the parent body, the Royal Agricultural Society, so that no farmer in any part of the wheat belt who is desirous of competing is prevented from doing so.

As can be readily understood, there is a considerable variation in rainfall, soil, etc., in a wheat belt so widely extended. For these reasons it has been subdivided into eight zones in such a manner that districts having similar interests and climatic conditions have been grouped together. In this way farmers may compete with each other more equitably. The accompanying map shows the eight zones referred to.

In each of these zones a championship prize of £10 and a second prize of £2 10s. are awarded. The competitors eligible for these awards are the first and second prize winners of the competitions held by the affiliated District Agricultural Societies and those competitors who have entered direct with the Royal Agricultural Society because of no district competition being conducted in their own district.

In addition to these zone prizes the Royal Agricultural Society each year offers a special prize of £5 5s. to the competitor in any zone obtaining the highest calculated bushel yield per acre. The prize was first offered in 1925.



The conditions of the competitions require that the crop shall be grown on fallowed land, shall not be less than 50 acres in area of one variety, and shall be judged under the following scale of points:—

Yield	50 points.
Freedom from weeds	10 points.
Freedom from disease	10 points.
Freedom from admixture	15 points.
Evenness of growth	15 points.
	100 points.

The system adopted has been to allot one point for each calculated bushel yield, which is determined not by estimation but upon that calculated from portions of the crop obtained from small areas taken systematically throughout the crop. These samples are then threshed and the grain weighed.

Since the inception of the Royal and District Crop Competitions the judges have been Departmental Officers attached to the Wheat Branch of the Department of Agriculture.

The awards and judges' reports, together with a detailed analysis of the cultural details of all competitors, have been prepared and will be found in the following pages.

ZONE 1.

Judge—F. L. Shier, Agricultural Adviser.

Three Springs Society—4 competitors.

Carnamah Society—9 competitors.

Total—13 competitors.

THREE SPRINGS AGRICULTURAL SOCIETY.

The rainfall recorded at Three Springs was as follows:—

	Growing Period.												
	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total for year.
Three Springs ...	.91	...	188	101	346	184	264	618	91	218	1,721	2	12	2,115

The awards made and the cultural details are tabulated hereunder:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points.	Evenness of Growth. 15 points.	Total. 100 points.
Hebiton, J. K. ...	Three Springs	Bena ...	37	9	9	13	14	82
Lynch, Senator ...	Mt. Leonora	Gluclub ...	34	8	9	13	13	77
Byrne & Sons, E. L.	Three Springs	Bena ...	33	8	9	13	13	76
Padbury, Wm. ...	Three Springs	Bena ...	29	9	9	12	13	72

CULTURAL DETAILS.

Competitor.	Years cropped.	Timber.	When ploughed.	Implement.	Subsequent cultivations.	Variety.	When Planted.	Rate of Seed.	Rate of Super	Seed treatment.	Graded.	Disease.
Hebiton, J. K.	Old land	York gum	July	Disc	Cross disc ploughed in September. Springtyne cultivated March dry, and in April after rain. Planted with combined cultivator drill	Bena	2nd week May	50	80	Copper carbonate	Yes	Trace Rust
Lynch, Senator	Five crops	Salmon gum	June-July	Mould-board	Cultivated with disc cultivating plough October. Springtyne cultivated early April after rain. Planted with combined cultivator drill	Gluclub	2nd week May	58	60	Copper carbonate	Yes	Trace Take-all
Byrne & Sons, E. K.	Old land	York, salmon gum, and morrell	July	Disc	Cross-ploughed October. Springtyne cultivated twice after rains in March. Planted with combined cultivator drill	Bena	Mid May	60	80-90	Copper carbonate	Yes	Trace Rust
Padbury, W. ...	Old land	Salmon gum, York gum, and gimlet	July	Disc	Springtyne cultivated October and after April rains. Planted with combined cultivator drill	Bena	1st week May	52	93	Copper carbonate	Yes	Trace Rust

CARNAMAH AGRICULTURAL SOCIETY.

The rainfalls recorded at Carnamah, Coorow, and Winchester were as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Carnamah ...	54	...	152	136	266	185	342	757	63	262	1,875	...	16	2,233
Coorow	73	...	205	93	293	179	227	719	84	218	1,720	...	1	2,092
Winchester ...	89	...	162	120	273	167	266	740	92	205	1,743	3	13	2,130

The awards made and the cultural details are tabulated hereunder:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Forrester, J. K. ...	Carnamah ...	Gluyas Early	40	8	9	14	14	85
Morecombe, B. T. ...	Coorow ...	Gluyas Early	34	9	9	13	13	78
Bothe, B. D. ...	Coorow ...	Bencubbin ...	32	9	9	14	13	77
Bowman, J. ...	Carnamah ...	Felix ...	33	8	8	13	14	76
Sharp, Mrs. ...	Carnamah ...	Carrabin ...	30	9	9	14	14	76
Nincham Bros. ...	Carnamah ...	Merredin ...	31	8	9	12	13	73
Robertson, C. ...	Carnamah ...	Bencubbin ...	31	7	8	14	13	73
Diamond, R. Mc. W.	Carnamah ...	Merredin ...	29	9	9	12	13	72
Mosedale & Fowler	Winchester...	Merredin ...	24	8	8	13	12	65

CULTURAL DETAILS.

Competitor.	Years cropped.	Timber.	When ploughed.	Implement.	Subsequent cultivations.	Variety.	When Planted.	Rate of Seed.	Rate of Super.	Seed treatment.	Graded.	Disease.
Forrester, J. K.	6	York gum and black mallee	June	Disc	Cultivated with disc cultivating plough. Springtyne cultivated end September. Disc cultivated third week May. Planted with combined cultivating drill	Gluyas Early	1st June	50	120	Copper carbonate	Yes	Trace Flag Smut
Morcombe, P. T.	5	Salmon gum and gimlet	July	Disc	Springtyne cultivated September and harrowed. Springtyne cultivated after March rains. Planted with combined cultivator drill	Gluyas Early	1st week May	60	100	Copper carbonate	Yes	Trace Flag Smut
Bothe, B. D. ...	Old land	Salmon gum	July	Mouldboard	Springtyne cultivated September, and again after April rains. Planted with combined cultivator drill	Bencubbin	2nd week May	60	90	Copper carbonate	Yes	
Bowman, J. ...	Old land	...	June-July	Disc	Springtyne cultivated September and October, and again after March rains, followed by disc harrows. Planted with disc drill	Felix	2nd week May	50	120	Untreated	Yes	Trace Ball Smut
Sharp, Mrs. ...	5	Salmon gum	June	Disc	Cultivated with disc cultivating plough in September. Springtyne cultivated early April after rain. Planted with Combined cultivator drill	Carrabin	End of May	48	90	Copper carbonate	Yes	
Nineham Bros.	6	Salmon gum	June	Disc	Springtyne cultivated September. Planted with combined cultivator drill	Merredin	4th week May	50	75	Copper carbonate	Yes	
Robertson, C. ...	Old land	Salmon gum, gimlet and jam	July	Disc and mouldboard	Cultivated with disc cultivating plough October, and twice prior to seeding. Planted with disc drill	Bencubbin	1st week May	50	90	Copper carbonate	Recleaned	Trace Take-All
Diamond, R. Mc. W.	Old land	Salmon and York gum	end July	Disc	Springtyne cultivated September and after April rains. Planted with combined cultivator drill	Merredin	Last week May	50	90	Copper carbonate	Yes	
Mosedale & Fowler	3	Jam and York gum	August	Disc	Planted with combined cultivator drill	Merredin	1st week May	50	90	Copper carbonate	Yes	Take-all

ZONE 2.

Judge—J. H. Langfield, Manager Merredin Experiment Farm.

Royal Society—1 competitor.

Dalwallinu Society—7 competitors.

Total—8 competitors.

DALWALLINU AGRICULTURAL SOCIETY.

The rainfall recorded at Dalwallinu was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Dalwallinu ...	138	...	268	91	222	118	200	555	80	140	1,315	...	11	1,823

The awards made and the cultural details are tabulated hereunder:—

Awards.

Competitor.	Address.	Variety.	Calculated Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Butcher, O. ...	Dalwallinu ...	Gluclub ...	42	9	9	13	14	87
Locke, F. C. ...	Dalwallinu ...	Bencubbin ...	36	8	10	14	13	81
Sutherland Bros. ...	Dalwallinu ...	Gluyas Early	35	8	9	14	13	79
Sutcliffe Bros. ...	Dawalllinu ...	Gluclub ...	34	9	8	14	13	78
Honner, R. J. ...	Dalwallinu ...	Gluyas Early	30	8	9	14	13	75
Bradford Bros. ...	Dalwallinu ...	Gluclub ...	31	8	8	13	13	73
Roberts, E. T. ...	Dalwallinu ...	Pusa ...	20	7	8	12	13	60

CULTURAL DETAILS.

Competitor.	Timber.	When ploughed.	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Butcher, O. ...	Salmon gum, gimlet	June–July	Good	Mouldboard	in. 4	Springtyne cultivated prior to seeding with a disc drill	Gluclub	1st week May	lbs. 33	lbs. 112	Copper carbonate	Yes	
Locke, F. C. ...	Salmon gum, gimlet	June–July	Good	Mouldboard	4	Springtyne cultivated August, Sept., Jan. and March, and twice prior to seeding	Bencubbin	End May	36	100	Copper carbonate	Yes	
Sutherland Bros....	Salmon gum, gimlet	August	Good	Disc ...	3 4	Springtyne cultivated Sept.; disc cultivated October, and springtyne cultivated April	Gluyas Early	3rd week May	45	100	Copper carbonate	Yes	
Sutcliffe Bros. ...	Salmon gum, gimlet	June–July	Good	Disc cultivating plough	3	Springtyne cultivated twice in August, once in Sept. and April. Planted with combined cultivator drill	Gluclub	2nd week May	34	90	Copper carbonate	Yes ...	Trace Flag Smut
Honner, R. J. ...	Salmon gum, gimlet	June–July	Good	Mouldboard	4	Springtyne cultivated three times in Spring, again in March and harrowed and cultivated prior to planting with combined cultivator drill	Gluyas Early	Mid-May	45	120	Copper carbonate	Yes	
Bradford Bros. ...	Salmon gum, gimlet	June July	Good	Disc cultivating plough	3 4	No cultivations prior to planting	Gluclub	Mid-May	35	90	Copper carbonate	Yes ...	Flag Smut
Roberts, E. T. ...	Salmon gum, gimlet	July ...	Good	Mouldboard	3–4	Springtyne cultivated in Sept., April, and twice prior to planting	Pusa	June	50	70	Untreated	Yes ...	Ball Smut

ROYAL AGRICULTURAL SOCIETY.

The following is the rainfall recorded at Indarra, where the only entry direct with the parent body was made in this zone:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Tenindewa ...	119	8	64	120	259	151	192	362	60	137	1,161	...	35	1,507

The award and cultural details are as set out below:—

Award.

Competitor.	Address.	Variety.	Calculated Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Moore, T.	Indarra ...	Bencubbin ...	39	9	10	14	14	86

CULTURAL DETAILS.

Competitor.	Timber.	When ploughed.	Condition of land.	Implement.	Depth.	Subsequent cultivations.
Moore, T.	Yorkgum, jam	June	Good	Disc cultivating plough	ins. 3	Springtyne cultivated in August, September, January. Planted with a combined cultivator drill

Competitor.	Variety.	Planted.	Rate of Seed,	Rate of Super.	Seed treatment.	Graded.	Diseases.
Moore, T.	Bencubbin	1st week May	lbs. 55	lbs. 100	Copper carbonate	Recleaned	

ZONE 3.

Judge—N. Davenport, Agricultural Adviser.

All four competitors in this zone entered direct with the Royal Agricultural Society.

The rainfalls as recorded at the respective centres are as follow:—

	Growing Period.												
	Jan.	Feb.	Mar.	Apl.	May	June	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	Total for year.
Wongan Hills	43	...	107	111	302	158	384	515	85	133	1,577	..	...	1,888
Cowcowing ...	72	91	78	171	173	89	259	341	66	162	1,090	1	8	1,511
Goomalling	63	5	55	92	260	169	358	465	88	209	1,549	4	8	1,776

The awards made and cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Mt. Rupert Co. ...	Wongan Hills	Merredin ...	37	9	8	14	14	82
Jones, W. W. ...	Cowcowing...	Bencubbin ...	36	9	9	14	13	81
Lane, W. H. and V. R.	Wongan Hills	Ford ...	34	8	8	13	13	76
Woodfield, N. ...	Goomalling ...	Bena ...	31	9	8	14	12	74

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Mt. Rupert Co.	Old land	Salmon gum, gimlet and morrel	Mid June	Good	Mouldboard	in. 4	Springtyne cultivated Aug. and May. Planted with combined cultivator drill; harrowed after seeding	Merredin	2nd week June	lb. 60	lb. 80	Copper carbonate	Yes	Flag Smut and Take-all
Jones, W. W.	5	Salmon and yorkgum and little morrel	Early July	Good	Disc ...	4	Planted with combined cultivator drill with light harrows attached	Bencubbin	1st week May	50	90	Copper carbonate	Yes	
Lane, W. H. & V. R.	8	Salmon gum and gimlet	Cultivated June; Ploughed August	Fair to good	Mouldboard	3	Springtyne cultivated April and prior to drilling. Planted with disc drill with light harrows attached	Ford ...	2nd week May	60	90	Copper carbonate	Yes	Take-all and Flag Smut
Woodfield, N. H. C.	Old land	Salmon and yorkgum and scrub	July	Fair	Disc cultivating plough	3	Rigidtyne scarified Sept., part in October, again in April. Planted with disc drill with light harrows attached	Bena ...	1st week May	60	90	Copper carbonate	Yes	Rust. Flag Smut and Take-all

ZONE 4.

Judge—G. L. Throssell, Agricultural Adviser.

Southern Cross Society—5 competitors.

Nungarin Society—13 competitors.

Mt. Marshall Society—2 competitors.

Total—20 competitors.

SOUTHERN CROSS AGRICULTURAL SOCIETY.

The rainfalls as recorded at Turkey Hill, Ghooli, and Corinthian were as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Turkey Hill ...	58	20	76	61	210	68	101	242	49	318	988	...	92	1,295
Yilgarn Exp. Farm	58	36	61	65	186	92	121	278	53	210	940	...	36	1,196
Corinthian ...	21	23	69	70	213	91	142	266	69	172	953	...	32	1,268

The awards made and cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Calculated Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Smith, P. J. ...	Turkey Hill	Noongaar ...	22	8	8	13	13	64
Stevens, G. K. ...	Ghooli ...	Bencubbin ...	18	9	9	14	12	62
Stevens, G. K. ...	Ghooli ...	Nabawa ...	18	9	9	14	11	61
Stevens, G. K. ...	Ghooli ...	Noongaar ...	17	8	9	13	11	58
Mell, A. J. ...	Corinthian ...	Noongaar ...	13	7	9	8	11	48

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations..	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Smith, P. J. ...	1st	Salmon gum, gimlet, jam and wattle	July-Aug.	Good	Disc ...	in. 3	Planted with combined cultivator drill	Noongaar	3rd week May	lb. 24	lb. 54	Copper carbonate	Yes	Trace of Flag Smut
Stevens, G. K.	1st	Salmon gum, and gimlet	June	Good	Disc ...	3–4	Springtyne cultivated Sept., and planted with combined cultivator drill	Bencubbin	2nd week May	27	80	Copper carbonate	Yes	
Stevens, G. K.	1st	Salmon gum and gimlet	June	Good	Disc ...	3 4	Springtyne cultivated Sept., and planted with combined cultivator drill	Noongaar	3rd week May	27	80	Copper carbonate	Yes	Badly affected by frost
Stevens, G. K.	1st	Salmon gum, and gimlet	June	Good	Disc ...	3–4	Springtyne cultivated Sept., and planted with combined cultivator drill	Nabawa	End of 2nd week May	27	80	Copper carbonate	Yes	
Mill, A. J. ...	3rd	Mallee and jam scrub	July	Patchy	Disc ...	3	Springtyne cultivated Oct., planted with combined cultivator drill	Noongaar	Mid May	30	75	Copper carbonate	Re-cleaned	

NUNGARIN AGRICULTURAL SOCIETY.

The rainfalls as recorded at the various centres were as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Nukarni	53	12	69	125	138	93	277	231	75	263	1,077	...	22	1,358
Wilgoyne ...	58	6	60	90	107	57	175	324	29	146	838	...	46	1,098
Nungarin ...	73	6	67	98	192	66	279	262	60	239	1,098	...	45	1,387
Mukinbudin ...	47	23	102	93	140	64	190	340	64	163	961	...	25	1,251
Mangowine ...	110	1	58	76	101	45	273	270	49	192	930	...	...	1,175
Talgomine ...	143	23	77	93	159	94	253	258	42	252	1,058	...	29	1,423

The awards made and cultural details are set out below:—

Awards.

Competitor.	Address.	Variety.	Estimated Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Creagh Bros. ...	Kwelkan ...	Gluyas Early	33	9	8	13	13	76
Evans, L. D. ...	Nukarni ...	Bencubbin ...	30	9	8	14	13	74
Clamp, Geo. ...	Barbalin ...	Gluyas Early	27	9	8	13	12	69
Maddocks, N. G. ...	Wilgoyne ...	Gluyas Early	25	9	7	14	13	68
Philbey, F. G. ...	Nungarin ...	Gluyas Early	24	8	7	14	14	67
Manuel, C. J. ...	Mukinbudin	Gluyas Early	24	9	8	14	12	67
Clamp, A.	Barbalin ...	Gluyas Early	26	8	7	12	13	66
Harris, E. G. ...	Mukinbudin	Gluyas Early	23	9	7	13	13	65
Jones, D.	Nungarin ...	Nabawa ...	24	8	7	13	13	65
Williams, F. A. ...	Mangowine...	Carrabin ...	22	8	8	13	13	64
Young, G. T. ...	Talgomine ...	Noongaar ...	24	7	6	13	12	62
Jolly, H.	Mangowine...	S.H.J. ...	21	8	7	13	12	61
Maddocks, Geo. ...	Wilgoyne ...	Nabawa ...	20	7	7	12	12	58

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of Seed.	Rate of Super.	Seed Treatment.	Graded.	Diseases.
Creagh Bros.	6	Salmon gum, gimlet and yorrell	End July	Good	Heavy Disc	in. 4	Rigid-tyne scarified end September; springtyne cultivated end April with combined cultivator drill	Gluyas Early	Last week May	lbs. 45	lbs. 90	...	Yes ...	Flag Smut and Take-all
Evans, L. D.	3	Salmon gum and mallee	Early June	Good	Disc cultivating plough	3	Rigid-tyne scarified July August; harrowed mid-August; planted with combined cultivator drill	Bencubbin	Early May	45	75	...	Yes ...	Take-all
*Clamp, Geo.														
Maddock, N. G.	3	Salmon gum and mallee	June and July	Good	Part rigid-tyne scarified, remainder with disc cultivating plough	3 to 4	Springtyne cultivated mid-August; planted with combined cultivator drill	Gluyas Early	3rd week May	33	60	Copper carbonate	Yes ...	Take-all
Philby F. C.	4	Salmon gum and mallee	Mid July	Good	Disc cultivating plough	3	Ploughed back mid-Sept.; cultivated with disc cultivating plough prior to seeding with a combined cultivator drill	Gluyas Early	1st week May	50	100	Copper carbonate	Yes ...	Flag Smut and Take-all
Manuel, C. J.	6	Salmon gum and gimlet	Early June	Good	Mouldboard	3½	Springtyne cultivated in August, Sept., and prior to drilling Planted with disc drill	Gluyas Early	Mid-May	45	90	Copper carbonate	Yes ...	Take-all and Flag Smut
Clamp, A. ...	3	Salmon gum, jam and mallee	Early June	Good	Disc cultivating plough	4	Springtyne cultivated end July; harrowed immediately after; cultivated again in Sept. Planted with combined cultivator drill	Gluyas Early	Last week May	45	90	Copper carbonate	Yes ...	Take-all and Flag Smut
Harris, E. G.	6	Salmon gum and gimlet	Mid-June	Good	Rigidtyne scarifier	3	Rigidtyne scarified July; cultivated with disc cultivating plough August and again prior to seeding and after a working by a springtyne cultivator. Planted with a combined cultivator drill	Gluyas Early	1st and 2nd week May	42	70	Copper carbonate	No ...	Take-all Flag Smut and Bunt

* Details not available

CULTURAL DETAILS—*continued.*

Competitor.	No. of years cropped.	Timber.	Whed ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lb.	lb.			
Jones, D. ...	Old land	Salmon gum and gimlet	June-July	Good	Disc cultivating plough	4	Twice cultivated with disc cultivating plough, and again with springtyne cultivator	Nabawa	Last week April	45	90	Copper carbonate	Yes	Take-all
Williams, F. A.	Old land	...	July	Good	Disc cultivating plough	3	Springtyne cultivated in Sept.; planted with combined cultivator drill; harrowed after seeding	Carrabin	Mid-May	45	80	Copper carbonate	Yes	
Young, G. ...	4	Salmon gum and gimlet	Early June	Rather dry	Disc ...	3½	Springtyne cultivated in Aug., again after rain in March, and again prior to seeding, which was done with a combined cultivator drill with light harrows attached	Noongaar	3rd week May	45	75	Copper carbonate	Yes	Flag Smut and Take-all
Jolly, H. ...	Old land	Salmon gum, gimlet, mallee and tea-tree	June	Good	Mouldboard	3–4	Harrowed mid Sept. and planted with combined cultivator drill	S.H.J.	1st week May	60	75	Copper carbonate	Yes	
Maddock, N. G.	Old land	Jam ...	June	Good	Heavy Disc	4	Cultivated with disc cultivating plough during Sept., and prior to seeding. Planted with disc drill with light harrows attached	Nabawa	3rd week April	45	90	Copper carbonate	Yes	Take-all

MT. MARSHALL AGRICULTURAL SOCIETY.

Judge—G. L. Throssell, Agricultural Adviser.

The rainfall as recorded at Bencubbin was as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Bencubbin ...	77	...	125	98	166	77	205	390	78	188	1,104	...	15	1,419

The awards made and cultural details are as set out below:—

Awards.

Competitor.	District.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Hopwood, B. W. G.	Mt. Marshall	Bencubbin ...	27	8	8	14	13	70
Thompson, M. A. ...	Mt. Marshall	Gluyas Early	17	7	6	14	11	55

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.
						in.	
Hopwood, B. W. G.	5	Light mallee and jam	June	Good	Disc ...	4	Springtyne cultivated in August. Planted with combined cultivator drill
Thompson, M. A.	3	Salmon gum and gimlet	July	Good	Heavy disc	4	Cultivated with cultivating plough end August and early Sept.; springtyne cultivated Oct. Planted with combined cultivator drill

Competitor.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
			lb.	lb.			
Hopwood, B. W. G. ...	Bencubbin	End of April	45	135	Copper carbonate	Yes	Take-all
Thompson, M. A. ...	Gluyas Early	2nd week May	33	80	Copper carbonate	Yes	Root-rot

ZONE 5.

Judge—R. P. Roberts, Agricultural Adviser.

Royal Society—1 competitor.

Merredin Society—11 competitors.

Bruce Rock Society—3 competitors.

Total—15 competitors.

MERREDIN AGRICULTURAL SOCIETY.

The rainfalls as recorded at the various centres were as follow:—

	Growing Period.													Total for year.
	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sep.	Oct.	Total.	Nov.	Dec.	
Paandee	29	...	59	70	143	74	234	353	70	296	1,170	†	†	*1,328
Walgoolan ...	139	...	75	99	170	100	280	261	123	296	1,230	†	†	*1,543
Belka	71	8	53	93	194	147	325	319	91	305	1,381	2	14	1,622
Ulva	49	7	73	68	179	98	343	297	57	339	1,313	...	14	1,524
Merredin ...	72	14	68	51	173	92	289	286	79	296	1,215	...	15	1,435
Norpa	81	11	61	51	169	105	347	241	72	362	1,296	†	†	*1,500
Burracoppin ...	49	...	76	81	132	105	291	224	32	292	1,076	...	25	1,307
Nukarni	53	12	69	125	138	93	277	231	75	263	1,077	...	22	1,358

* Total to October. † Returns not to hand.

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	District.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Kay, J.	Paandee ...	Gluclub ...	40	8	8	12	14	82
Teasdale, F. ...	Korbel ...	Bencubbin ...	36	8	8	14	13	79
Barnet, L.	Walgoolan ...	Gluyas Early	35	7	8	14	14	78
Cook, W. T. ...	Walgoolan ...	Gluyas Early	31	9	8	13	14	75
Teasdale, H. ...	Ulva ...	Geeralying ...	31	7	8	14	13	73
Smallacombe, T. H.	Merredin ...	Gluclub ...	28	9	8	13	13	71
Flockart, I. H. ...	Korbel ...	Gluyas Early	28	7	7	14	14	70
Thynne Bros. ...	Norpa ...	Merredin ...	29	9	7	13	12	70
Maughan, D. ...	Walgoolan ...	Gluyas Late	28	8	7	11	14	68
Lambert, J. B. ...	Burracoppin	Merredin ...	30	8	7	10	13	68
Cockram, W. H. ...	Nukarni ...	Noongaar ...	22	6	7	13	12	60

CULTURAL DETAILS.

Competitor.	Years cropped.	Original timber.	When ploughed.	Condition of land.	Implements.	Depth. Depth.	Subsequent cultivations.	Variety.	Rate of seed.	Rate of super.	Graded.	When planted.	Disease.
Kay, J.	Old land	Salmon gum, gimlet and morrel	July	Fairly good	Mould-board	ins. 4	Cultivated with a rigid tyne scarifier in August-September and again before seeding	Gluclub	lb. 50	lb. 100	Yes	3rd week in May	A little flag smut and trace of take-all.
Teasdale, F. O. ...	Old land	Gimlet and salmon gum	July	Good	Mould-board	3	Cultivated with a springtyne implement in September and again before seeding	Bencubbin	45	112	Yes	2nd week in May	A little take-all.
Barnet, L. T. C. ...	Old land	Salmon gum, gimlet and a little morrel	June-July	Good	Disc	3–4	Reploughed in August, and part cultivated with a springtyne implement in Sept ; springtyne cultivated before seeding	Gluyas Early	39	130	Yes	Middle of May	A little flag smut and take-all.
Cook, W. T. ...	4th crop	Morrel and mallee	June-July	Fair	Scarifier	3	Worked with a rigid tyne cultivator in August ; cultivated with a springtyne implement in September, and with the rigid tyne implement prior to seeding.	Gluyas Early	43	90	Yes	2nd week in May	A little flag smut and take-all and a trace of bunt
Teesdale, H. W. ...	Old land	Gimlet and a little salmon gum	June-July	Good	Disc	3	Scarified in September and again before seeding	Geeraly-ing	44	100	Yes	3rd week in May	A little take-all.
Smallacombe, T. H.	Old land	Mallee, jam scrub, and tea-tree	July	Good	Disc	3	Cultivated with a disc implement in August and with a springtyne implement in Sept. ; springtyne cultivated prior to seeding	Gluclub	53	90	Yes	2nd week in May	A little flag smut and take-all.
Flockart, I. H. ...	Old land	Gimlet and salmon gum	June	Good	Skim mould-board and disc	3	Skim ploughed in August ; cultivated with springtyne cultivator in October	Gluyas Early	45-50	112	Yes	Last week in May	Some flag smut and a trace of take-all.
Thynne Bros. ...	3rd crop	Gimlet, jam scrub, and morrel	June-July	Good	Disc	3	Springtyne cultivated in September	Merredin	45	80	Yes	3rd week in May	Flag smut and take-all.

CULTURAL DETAILS—*continued.*

Competitor.	Years cropped.	Original timber.	When ploughed.	Condition of land.	Implements.	Depth.	Subsequent cultivations.	Variety.	Rate of seed.	Rate of super.	Graded.	When planted.	Disease.
						ins.			lb.	lb.			
Maughan, D. ...	3rd crop	Salmon gum and gimlet	First week in June	Good	Disc	3	Disced in August. Springtyne cultivated in September and cultivated with a rigid tyne implement in March	Late Gluyas	45	136	Yes	1st week in May	Trace of flag smut and a little take-all.
Lambert, J. B. ...	5th crop	Salmon gum and gimlet	June	Good	Disc	3	Cultivated with a springtyne implement in September and again after rain in February	Merredin	39	80	Yes	2nd week in May	Flag smut and a little take-all.
Cockram, W. H. ...	Old land	Gimlet and salmon gum	July	Good	Disc	3½-4	Reploughed in August; springtyne cultivated in September	Noongaar	70	90	Yes	2nd week in June	Take-all and a trace of flag smut.

BRUCE ROCK AGRICULTURAL SOCIETY.

The rainfall as recorded at Bruce Rock was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Bruce Rock ...	70	8	29	57	230	99	288	355	62	340	1,374	...	8	1,546

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	District.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points.	Evenness of Growth. 15 points.	Total. 100 points.
Smith, C., & Sons ...	Bungulluping	Gluclub ...	37	9	9	13	13	81
Smith, C. & A. H. ...	Yalbarrin ...	Gluclub ...	32	8	7	13	13	73
Farrell, F. C., & Sons	Bruce Rock	Bencubbin ...	32	8	7	12	12	71

CULTURAL DETAILS.

Competitor.	Years cropped.	Original timber.	When ploughed.	Condition of land.	Implement.	Depth.	Subsequent cultivations.	Variety.	Rate of Seed.	Rate of Super.	Graded.	When planted.	Disease.
						in.			lb.	lb.			
Smith, C. & Sons	Old land	Salmon gum and gimlet	June	Good	Disc ...	3	Cultivated with a rigid tyne implement at the end of August	Gluclub	35	90	Yes	4th–11th May	Trace of take-all and flag smut.
Smith, C. & A. H.	5th crop	Salmon gum and gimlet, and a little mallee	Early June	Good	Rigid tyne scarifier	2–2½	Cultivated with a rigid tyne implement the first week in August, and again in early September. Cultivated with a springtyne implement in April	Gluclub	45	90	Re-cleaned	Middle of May	Some flag smut and take-all.
Farrall, F. C. & Sons	Old land	Salmon gum, gimlet, and a little mallee	Early June	Good	Mould-board and disc	4	Half rigid tyne cultivated and balance disc cultivated in mid-August. Springtyne cultivated in October and January. Springtyne cultivated last week in April	Bencubbin	54	96	Yes	7th–8th May	Take-all.

ROYAL AGRICULTURAL SOCIETY.

There was only one competitor entered direct with the parent Society in this zone, viz., Mr. J. Deane Hammond.

The rainfall recorded at "Cuttening" was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Cuttening ...	49	...	37	80	187	144	310	371	94	352	1,458	...	...	1,624

The award made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Society.	Variety.	Calculated Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Hammond, J. Deane	Kellerberrin	Royal ...	Bencubbin	30	8	8	14	13	73

CULTURAL DETAILS.

Competitor.	Years cropped.	Original timber.	When ploughed.	Condition of land.	Implement.	Depth.	Subsequent cultivations.
Hammond, J. D.	Old land	Salmon gum and gimlet	July	Good	Mouldboard	5in.	Springtyne cultivated in September and again in October; springtyne cultivated in March, and again in May, prior to seeding

Competitor.	Variety.	Rate of Seed.	Rate of Super.	Graded.	When planted.	Disease.
Hammond, J. D.	Bencubbin	60	100	Yes	10th May	Some take-all and traces of rust and bunt.

ZONE 7.

Judge—A. S. Wild, Agricultural Adviser.

Royal Society—1 competitor.
Karlgarin Society—24 competitors.
Harrismith Society—5 competitors.
Kulin Society—10 competitors.
Lake Grace Society—8 competitors.
Kukerin Society—12 competitors.
Total—60 competitors.

KARLGARIN AGRICULTURAL SOCIETY.

The rainfalls as recorded at Karlgarin, Kondinin, Hyden Rock, and Lake Carmody were as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Karlgarin ...	50	3	31	33	204	96	254	290	127	277	1,248	5	9	1,379
Kondinin ...	43	2	47	102	291	112	283	372	201	340	1,599	4	6	1,803
Lake Carmody ...	79	...	55	71	180	139	254	290	127	277	1,267	†	†	*1,472
Sth. Hyden Rock	70	3	54	74	146	108	244	210	73	278	1,059	...	4	1,264
Nth. Hyden Rock (Camel Peaks)	78	5	36	104	211	125	282	267	99	270	1,254	...	...	1,477

† Records not to hand. * To October 31st.

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Trestrail, S. J. ...	Karlgarin ...	Gluclub ...	36	9	8	14	14	81
Smith, W. G. ...	Kondinin ...	Ford ...	36	8	9	13	14	80
James, S. W. ...	Nth. Karlgarin	Gluyas Early	35	9	9	12	14	79
Treasure, C. W. ...	Karlgarin ...	Bencubbin ...	35	9	8	13	13	78
Parsons & Sons ...	Kondinin ...	Waratah ...	33	9	8	13	14	77
Grant, L. J. ...	Karlgarin ...	Gluyas Early	33	9	8	12	13	75
Repacholi, D. ...	Kondinin ...	Ford ...	34	8	7	13	13	75
McLennan, A. T. ...	Hyden Rock	Merredin ...	32	8	8	13	13	74
Biglin, E. J. & D. A.	Karlgarin ...	Geeralying ...	29	8	8	14	14	73
Clayton, R. G. ...	Hyden Rock	Gluyas Early	29	9	8	13	14	73
Green & Atkinson...	North Hyden Rock	Gluyas Early	29	9	9	13	13	73
Llewellyn, G. ...	Nth. Karlgarin	Gluyas Early	28	9	9	14	13	73
Davies, G. I. ...	Nth. Lake Carmody	Nabawa ...	29	9	9	12	13	72
Medcalf, G. E. ...	Karlgarin ...	Gluyas Early	29	9	9	12	13	72
Ray, J. G. ...	Nth. Karlgarin	Gluyas Early	29	9	7	13	14	72
Poole, H.	Karlgarin ...	Gluyas Late	27	9	9	13	13	71
Powell, P. L. ...	Karlgarin ...	Pusa ...	26	9	9	13	13	70
Fairclough, R. ...	Hyden Rock	Nabawa ...	26	9	9	13	12	69
Howlett, G. A. ...	Kondinin ...	Gluyas Late	28	7	8	13	13	69
Lynch, P. J. ...	Hyden Rock	Gluyas Early	26	9	8	13	13	69
Biglin, H. W. ...	Kondinin ...	Nabawa ...	25	8	8	13	14	68
Mouritz, W. ...	Hyden Rock	Gluclub ...	27	8	8	12	13	68
Medcalf, C. W. ...	Karlgarin ...	Gluyas Early	25	9	7	12	13	66
Shalders, R. O. ...	Sth. Hyden Rock	Nabawa ...	21	8	9	13	12	63

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lbs.	lbs.			
Trestrail, S. J.	5th crop	Salmon, gimlet, morrel, mallee	Early July	Good	Mouldboard	2½ 3	Rigidtyne cultivated early Sept; springtyne cultivated twice before seeding; harrowed just after seeding	Gluclub	1st June	45	90	Copper carbonate	Yes	Traces of Take-all and Flying Smut
Smith, W. G.	Old land	Salmon and gimlet	July–Aug.	Excellent	Mouldboard	4	Rigidtyne cultivated Sept.; planted with combined cultivator-drill with light drag-harrows attached	Ford	3rd week April	48	101	Copper carbonate	Yes	Traces of Take-all and Root-rot
James, S. W.	6th crop	Red morrel, gimlet, yorkgum	Early Aug.	Good	Disc ...	3	Disced 3in. deep early Sept.; springtyne cultivated just before drilling. Planted with combined cultivator drill	Gluyas Early	1st week June	39	60	Copper carbonate	Re-cleaned	Traces of Flag Smut
Treasure, C. W.	3rd crop	Salmon, gimlet, and mallee	July–Aug.	Good	Disc ...	3½	Disced 3in. deep late Aug. to early Sept; planted with combined cultivator-drill	Bencubbin	4th week May	38	90	Copper carbonate	Yes	Traces of Flag Smut in admixture. Take-all
Parsons & Sons	Old land	Salmon and gimlet	June-July	Good	Rigidtyne Scarifier	3	Rigidtyne cultivated Aug.-Sept.; springtyne cultivated April; planted with combined cultivator drill with light drag harrows attached	Waratah	1st week May	55	100	Copper carbonate	Yes	Traces of Ball Smut and Take-all
Grant, L. J.	3rd crop	Salmon, mallee, gimlet	June	Good	Disc ...	3	Disced 3in. deep July; Planted with combined cultivator-drill with light drag harrows attached	Gluyas Early	2nd June	34	72	Copper carbonate	Yes	Traces of Ball Smut and Take-all
Repacholi, D.	Old land	Salmon, gimlet, mallee	Early June, 1930	Good	Disc ...	3 4	Rigidtyne cultivated three times in Spring of 1930, and three times in Spring of 1931; planted with combined cultivator-drill with light drag harrows attached	Ford	1st week May	52	85	Copper carbonate	Yes	Traces of Ball Smut, Flag Smut, Take-all and Rootrot

CULTURAL DETAILS—*continued.*

Competitor.	No. of years cropped.	Timber.	When ploughed.	Condition of land.	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						ins.				lbs.	lbs.			
McLenna, A. T.	3rd crop	Salmon, gimlet, tea-tree	July	Fair	Disc ...	4	Disced 4in. deep Sept.; planted with combined cultivator-drill with light drag harrows attached	Merredin	20th May ...	40	60	Copper carbonate	Yes	Traces of Flag Smut, Flying Smut, and Take-all.
Biglin, E. J. & D. A.	2nd crop	Salmon and mallee	Sept.	Good	Rigid tyne scarifier	3	Springtyne cultivated in Oct. and again just before seeding	Geeralying	4th week May to 1st week June	45	60	Copper carbonate	Yes	Take-all.
Clayton, R. G.	3rd crop	Salmon, gimlet and mallee	July	Good	Disc ...	3	Disced 2in. deep Sept.; planted with combined cultivator-drill with light drag harrows attached	Gluyas Early	1st week May	45	60	Copper carbonate	Yes	Traces of Take-all and Flag Smut.
Green & Atkinkinson	1st crop	Salmon, gimlet, mallee	July	Very wet	Disc	3	Disced 3in. deep August; scrubby patches harrowed in April; springtyne cultivated in April; harrowed in May; planted with combined cultivator-drill	Gluyas Early	1st week June	36	100	Copper carbonate	Yes	Traces of Flag Smut.
Llewellyn, S.	3rd crop	Gimlet, salmon, jam, and mallee	June and August	Good	Disc	4	Springtyne cultivated in September and again just before seeding	Gluyas Early	Mid May ...	48	53	Copper carbonate	Yes	Traces of Take-all.
Davies, G. I.	1st crop	...	...	...	...	...	Springtyne cultivated in September and again just before seeding	Nabawa	End of April and early May	...	...	...	...	
Medcalf, G. E.	5th crop	Salmon and morrel	July	Good	Disc	2½	Springtyne cultivated in September; planted with combined cultivator-drill	Gluyas Early	Early May ...	45	75	Copper carbonate	Yes	Trace of Flag Smut.
Ray, J. G. ...	4th crop	Mallee, salmon, gimlet	July	Fair	Disc	3	Rigid-tyne cultivated just before seeding	Gluyas Early	4th week May	45	90	Copper carbonate	Yes	Little Flag Smut and trace of Take-all and Ball Smut.
Poole, H. ...	3rd crop	Gimlet, salmon, york gum, and morrel	Early July	Good	Disc	3	Disced 2in. deep in August; springtyne cultivated in August and again in September	Gluyas Late	1st fortnight May	50	80	Copper carbonate	Yes	Traces of Take-all and Ball Smut.

CULTURAL DETAILS—*continued.*

Competitor.	No. of years cropped.	Timber.	When ploughed.	Condition of land.	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						ins.				lbs.	lbs.			
Powell, P. L.	3rd crop	Salmon, gimlet, boree	August	Good	Disc	3	Springtyne cultivated in September; planted with combined cultivator-drill with light drag harrows attached	Pusa	4th week May	53	60	Copper carbonate	Yes	Trace of Take-all.
Fairclough, R.	1st crop	Gimlet, morrel, blackbutt, mallee	June	Good	Disc	3½	Harrowed in September; planted with combined cultivator-drill	Nabawa	1st week May	39	60	Copper carbonate	No	
Howlett, G. A.	5th crop	Salmon and gimlet	Sept.	...	Disc	4	Springtyne cultivated just before seeding	Gluyas Late	1st week May	45	63	Copper carbonate	Yes	Trace of Take-all.
Lynch, P. J. ...	3rd crop	Salmon, morrel, mallee	Sept.	Fair	Disc	3	Planted with combined cultivator-drill with light drag harrows attached	Gluyas Early	1st week May	45	60	Copper carbonate	Yes	Traces of Take-all and Flag Smut.
Biglin, H. W.	7th crop	Salmon and gimlet	June	Hard	Disc	3	Disced 3in. deep in August; springtyne cultivated in September and again at end of April after rain; planted with combined cultivator-drill with light drag harrows attached	Nabawa	2nd week May	50	90	Copper carbonate	No	Traces of Flying Smut and Take-all.
Mouritz, W. ...	2nd crop	Gimlet, salmon, mallee, morrel	June	Good	Disc	4	Disced 2in. deep August-September; springtyne cultivated in November; planted with combined cultivator-drill with light drag harrows attached	Gluclub	Mid-May ...	40	112	Copper carbonate	Yes	Trace of Ball Smut.
Medcalf, C. W.	3rd crop	Gimlet, salmon, mallee	July	Good	Disc	3	Springtyne cultivated in September and again just before seeding	Gluyas Early	1st week June	45	70	Copper carbonate	Yes	Ball Smut, Take-all.
Shalders, R. O.	3rd crop	Salmon gum	May	Good	Disc	3½	Disced 2in. deep in September; springcultivated just before seeding.	Nabawa	2nd week May	47	120	Copper carbonate	Yes	

HARRISMITH AGRICULTURAL SOCIETY.

The rainfall as recorded at Harrismith (Wedin) was as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Harrismith (Wedin) ...	112	7	57	91	441	160	317	353	92	320	1,683	2	...	1,952

The awards and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Murray, A. ...	Tinkurrin ...	Canberra ...	25	9	8	14	14	70
Norton, J.	Tinkurrin ...	Bena ...	27	8	8	13	13	69
Black, L. J. ...	Tinkurrin ...	Waratah ...	25	8	8	11	13	65
McDonald, A. W. ...	Tinkurrin ...	Canberra ...	22	8	8	13	13	64
McKenzie, J. A. ...	Harrismith ...	German Wonder	16	8	7	13	12	56

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Murray, A. ...	4th crop	Salmon, morrel, manna gum, jam	July	Good	Mouldboard	in. 3½ 4	Portion springtyne cultivated in Oct.; portion springtyne cultivated in April, and remainder rigidtyne cultivated. Earlier planting drilled with combined cultivator drill with light drag harrows attached. Later planting skim-ploughed with mouldboard and planted with disc drill	Canberra	1st week June and end of June	lb. 55	lb. 90	Copper carbonate	Yes	Traces of Flag Smut and Flying Smut
Norton, J. ...	3rd crop	Sheoak, jam, york-gum, morrel	June-July	Good	Disc ...	3	Springtyne cultivated in March. Planted with combined cultivator drill, with light drag harrows attached	Bena	2nd week May	60	93	Copper carbonate	Re-cleaned	Take-all
Black, L. J. ...	Old land, 1st crop for 9 yrs.	Jam, salmon, morrel	Sept.	Patchy	Disc ...	4	Planted with combined cultivator drill	Waratah	Mid. June	50	90	Copper carbonate	Yes	Traces of Flag Smut and Flying Smut and a little Take-all
McDonald, W.	3rd crop	Jam, york gum, salmon	Aug.	Good	Mouldboard	3	Springtyne cultivated in September. Planted with combined cultivator drill with light drag harrows attached. Harrowed four days after planting	Canberra	3rd week June	...	90	Copper carbonate	Yes	Traces of Flying Smut, Take-all, and Ball Smut
McKenzie, J. A.	Old land	Morrel, salmon, jam	Aug.	Wet	Disc ...	3–4	Springtyne cultivated end of March. Planted with combined cultivator drill	German Wonder	End of April	50 55	90	Copper carbonate	Yes	Take-all, Traces of Rust and Septoria

KULIN AGRICULTURAL SOCIETY.

The rainfalls as recorded at the various centres were as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.						Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Kulin	81	2	64	231	340	115	352	379	246	338	1,770	...	...	2,148
Kulin Rock ...	60	...	34	85	300	144	275	387	125	371	1,602	5	...	1,786
Gnarming ...	105	3	67	91	271	121	309	377	143	314	1,535	3	...	1,804
F. S. Freebairn *	120	5	61	64	194	52	285	231	206	289	1,257	...	†	‡1,507
R. Purser & Co. *	125	...	61	85	259	84	297	297	144	217	1,298	2	†	‡1,571
A. W. Trotter * ...	60	3	64	82	262	103	310	346	152	313	1,686	...	†	‡1,895

* Unofficial. † Records not to hand. ‡ To November 30th.

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Freebairn, F. S. ...	Jilakin ...	Gluclub ...	47	9	8	13	13	90
Trotter, A. W. ...	Kulin ...	Bena ...	41	8	9	14	13	85
Purser, R., & Co. ...	Jilakin ...	Gluclub ...	39	9	9	13	14	84
Scadding, N. A. ...	Jilakin ...	Gluclub ...	39	9	8	13	14	83
Bailey, G. A. ...	Kulin Rock...	Bena ...	37	8	8	14	13	80
Henderson, Mrs. F. F.	Gnarming ...	Queen Fan...	37	8	7	13	14	79
Meikle, P.	Kulin Rock...	Merredin ...	27	9	8	14	14	72
Nichols, R. ...	Kulin Rock...	Baroota Wonder Early	28	9	7	14	14	72
Bowey, P. J. ...	Kulin ...	Nabawa ...	28	8	8	14	12	70
Freebairn & Kemp	Kulin Rock...	Baroota Wonder Early	26	8	8	13	12	67

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Freebairn, F. S.	3rd crop	Salmon, morrel, jam, blackbutt	March, 1931	Dry	Rigidtyne scarifier	in. 3½	Rigidtyne scarified early Sept.; hard portions springtyne cultivated in April. Planted with combined cultivator dril. with light drag harrows attached. Fed off heavily during growing period.	Gluclub	1st week May	lb. 60	lb. 90	Copper carbonate	Yes	Flag Smut, trace of Take-all
Trotter, A. W	6th crop	Jam, yorkgum, morrel	July, 1930	Good	Disc ...	4	Springtyne cultivated late August, 1930; disced 3in. deep June, 1931. Springtyne cultivated just before seeding. Planted with combined cultivator drill with light drag harrows attached	Bena ...	9th-19th April	45	110	Bluestone	Yes	Trace of Flag Smut
Purser, R. & Co.	3rd crop	Salmon, gimlet, jam, yorkgum, mallee	June	Good	Disc ...	3	Springtyne cultivated early Sept, and again early April. Planted with combined cultivator drill with light drag harrows attached	Gluclub...	2nd week May	50	100	Copper carbonate	Yes	Traces of Flying Smut and Flag Smut
Scadding, N. A.	3rd crop	Morrel, teatree	June	Good	Disc ...	3	Springtyne cultivated in Sept. and again just before seeding	Gluclub...	1st week May	60	85	Copper car bonate	Yes	Traces of Take-all and Flag Smut
Bailey, G. A.	1st crop	Jam, yorkgum, salmon	June	Good	Disc ...	3-4	Planted with combined cultivator drill	Bena ...	End of April	45	80	Copper carbonate	Yes	Traces Septoria and Flag Smut
Henderson, Mrs. F. F.	2nd crop	Yorkgum, jam, salmon, morrel	July	Good	Rigidtyne scarifier	2½	Harrowed early August; rigidtyne scarified early Oct.; springtyne cultivated early Nov. and again in March. Planted with combined cultivator drill and harrowed just after	Queen Fan	4th 15th May	43	112	Copper carbonate	Yes	Traces of Flag Smut, Take-all, Ball Smut and Septoria

CULTURAL DETAILS—*continued.*

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lb.	lb.			
Meikle, P. ...	Old land	Salmon, gimlet	June-July	Fair	Mouldboard	3	Half mouldboard ploughed 2in. deep Sept.; remainder springtyne cultivated Sept., followed by harrowing in Oct. Planted with combined cultivator drill with light drag harrows attached	Merredin	Mid-May	40	95	Copper carbonate	Yes	Traces Flag Smut, Flying Smut & Take-all
Nichols, R. ...	9th crop	Gimlet, salmon, mallee	June	Good	Disc ...	3½	Disced 2in. deep in Aug.; springtyne cultivated Sept.; rigidtyne cultivated April. Planted with combined cultivator drill with light drag harrows attached	Baroota Wonder Early	1st-10th May	60	90	Copper carbonate	Yes	Traces Take-all, Flying Smut, Flag Smut, Ball Smut
Bowey, P. J.	Old land	Salmon, morrel	August	Fair	Rigidtyne scarifier	3	Springtyne cultivated April. Planted with combined cultivator drill	Nabawa	1st week May	50	75	Copper carbonate	Yes	Take-all, trace Septoria
Freebairn & Kemp	Old land	Salmon, mallee, morrel	June	Patchy	Disc ...	3	Rigidtyne cultivated Sept. and again middle April. Planted with combined cultivator drill with light drag harrows attached	Baroota Wonder Early	26th-30th April	60	70	Copper carbonate	Yes	Take-all, trace Flying Smut

LAKE GRACE AGRICULTURAL SOCIETY.

The rainfalls as recorded at Lake Grace, Burngup North, and Lake Biddy were as follow:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Lake Grace ...	150	12	49	97	278	69	246	382	161	225	1,361	7	22	1,698
Burngup, North...	152	9	65	95	235	85	326	380	155	271	1,452	15	...	1,788
Lake Biddy ...	159	2	59	118	228	72	286	253	69	279	1,187	3	2	1,530

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Stephens, F. ...	Sth. Lake Grace	Waratah ...	38	9	8	14	14	83
Bishop, H. J. ...	Lake Grace...	Waratah ...	36	9	8	13	14	80
Collinson & Fleay...	Burngup ...	Waratah ...	32	9	8	14	14	77
Woodburne, J. R. C.	Lake Grace...	Bena ...	32	9	8	13	13	75
Carruthers, H. F. ...	Lake Grace...	Waratah ...	30	8	9	13	13	73
Witham & Sons ...	Lake Biddy	Gluyas Late	28	9	9	13	13	72
Bishop, S. J. ...	Lake Grace...	Waratah ...	31	8	8	13	12	71
Lay, J.	Sth. Lake Grace	Gluyas Early	26	9	9	13	13	70

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lb.	lb.			
Stephens, F. ..	5th crop	Salmon and morrel	July	Good	Mouldboard	2½–3	Springtyne cultivated mid-August and again mid-Sept.; disced 2in. deep before seeding. Planted with combined cultivator drill with light drag harrows attached	Waratah	3rd week May	40	112	Copper carbonate	Yes	Trace Root Rot, Take-all
Bishop, H. J.	4th crop	Blackbutt	Late July	Good	Rigidtyne scarifier	2½	Rigidtyne scarified just before seeding. Planted with combined cultivator drill	Waratah	2nd week May	45	130	Copper carbonate	Yes	Traces of Take all and Flying Smut
Collinson & Fleay	3rd crop	Yorrel, morrel, salmon, boree, gimlet	July	Good	Disc ...	3	Springtyne cultivated just before seeding, light drag harrows attached to drill	Waratah	1st week May	33–35	100	Copper carbonate	No	Traces of Flag Smut and Flying Smut
Woodburne, J. R. C.	6th crop	Blackbutt, boree, morrel, yorrel	August	Good	Disc ...	3 3½	Drilled on surface and lightly covered with springtyne cultivator	Bena ...	1st week May	58	*Nil*	Untreated	No	Traces of Take-all and Flag Smut
Carruthers, H. F.	Old land	Salmon and gimlet	June	Good	Disc ...	3	Disced 2in. deep in Sept. and again in April. Planted with combined cultivator drill with light drag harrows attached	Waratah	1st week May	50	90	Copper carbonate	Yes	Trace of Take-all
Witham & Sons	6th crop	Salmon, yorkgum, gimlet	June	Good	Disc ...	3½	Springtyne cultivated Sept.; disced 2in. deep just before seeding	Gluyas Late	Mid-May	45	80	Copper carbonate	No	
Bishop, S. J.	4th crop	Gimlet, yorrel, boree, salmon	July	Good	Disc ...	3	Springtyne cultivated in August, again in May and again in June just before seeding	Waratah	1st week June	45	112	Copper carbonate	Yes	Take-all
Lay, J. ...	Old land	Gimlet ...	Late June	Good	Disc ...	3	Disced 2in. deep late July and again late Sept. Springtyne cultivated just before seeding	Gluyas Early	2nd week June	50	90	Copper carbonate	Yes	Trace of Flag Smut

KUKERIN AGRICULTURAL SOCIETY.

The rainfall as recorded at Kukerin was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Kukerin	158	24	58	116	288	145	378	417	127	540	1,895	2	35	2,288

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
English, C. ...	Sth. Kukerin	Yandilla King	36	9	8	13	14	80
Bahr, E. O. ...	Sth. Kukerin	Yandilla King	31	8	8	13	14	74
Nenke, B.	Kukerin ...	Ford ...	29	9	9	13	13	73
Faulkner, W. J. ...	Kukerin ...	Gallipoli ...	29	8	9	13	13	72
Sugg Bros. ...	Kukerin ...	Nizam ...	29	8	9	13	13	72
Troup, A.	Kukerin ...	Gallipoli ...	29	7	9	14	13	72
Williams, T. C. ...	Sth. Kukerin	Yandilla King	29	9	8	13	13	72
Smith, C. P. ...	Kukerin ...	Gallipoli ...	29	7	9	14	12	71
Ditchburn, R. ...	Nth. Kukerin	Gallipoli ...	26	7	9	14	13	69
Joyce, F.	Nth. Kukerin	Sailor's Fortune	27	8	9	12	13	69
Daffen Bros. ...	Kukerin ...	Bena ...	22	8	9	14	13	66
Smith, I.	Kukerin ...	Geeralying ...	19	8	9	13	12	61

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						In.				lb.	lb.			
English, C. ...	2nd crop	salmon gum, yorkgum	March, 1931	Dry	Rigidtyne scarifier	2	Skim ploughed with mouldboard 2in. deep June; rigidtyne scarified in August; half springtyne cultivated in January after rain; whole rigidtyne scarified in April	Yandilla King	1st week May	14	56	Copper car bonate	Yes	Little Take all
Bahr, E. O....	Old land	Yorkgum, manna and salmon gum, morrel, mallee	July	Good	Mouldboard	3	Springtyne cultivated in sept.; planted with combined cultivator drill; harrowed just after seeding	Yandilla King	End of April	40	70	Copper car bonate	Yes	Take-all and trace of Root-rot
Nenke, B. ...	3rd crop	salmon and gimlet	August	Good	Mouldboard	3½	Springtyne cultivated in sept., and again just before seeding	Ford ...	1st week June	42	90	Copper car bonate	Yes	Trace of Take-all
Faulkner W. J.	Old land	salmon and morrell	sept.	Wet	Mouldboard	3	Mouldboard ploughed 2in. deep just before seeding. Planted with combined cultivator drill; harrowed just after seeding	Gallipoli	3rd week June	35	90	Formalin	No	Trace of Take-all
Sugg Bros. ...	Old land	salmon and mallee	July	Good	Disc ...	4	Springtyne cultivated in Sept.; weedy portions springtyne cultivated in May. Planted with combined cultivator drill	Nizam ...	End of May	45	90	Copper car bonate	Yes	Trace of Root-rot
Troup A. ...	Old land	Morrel salmon mallee	July	Good	Mouldboard	3	Mouldboard ploughed 3in. deep in March, portion disced 2in. deep in April and remainder mouldboard ploughed in May	Gallipoli	Mid May	35	90	Copper car bonate	Yes	
Williams T. C.	3rd crop	salmon, morrel mallee	June	Good	Disc ...	3	Disced 3in. deep late Aug.; springtyne cultivated 2in. deep late sept. again in October and again just before seeding. Planted with combined cultivator drill	Yandilla King	2nd week May	49	112	Copper car bonate	Yes	Take-all

CULTURAL DETAILS—*continued.*

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Smith, C. P....	Old land	Salmon and morrel	July	Good	Disc ...	in. 2	Sprintgyne cultivated in Sept. and again just before seeding. Planted with combined cultivator drill	Gallipoli	Mid-May	lb. 45	lb. 80	Copper carbonate	Yes	
Ditchburn, R.	Old land	Salmon, morrel, mallee	July	Good	Mouldboard	3	Disced 2in.-2½in. deep April; planted with combined cultivator drill	Gallipoli	Mid-May	70–75	90	Copper carbonate	Re-cleaned	Trace of Take all
Joyce, F. ...	Old land	Salmon, morrell, gimlet, mallee	August	Fair	Mouldboard	3	Mouldboard ploughed 2in. deep in Sept., and again just before seeding; harrowed just after drilling	Sailer's Fortune	1st week June	45	60	Formalin ...	Yes	Trace of Ball Smut
Daffen Bros....	Old land	Salmon and morrel	August	Good	Disc ...	4	Disced 2in. deep in Sept. and again in October; springtyne cultivated just before seeding	Bena ...	1st week May	50	75	Copper carbonate	Yes	Trace of Take-all
Smith, I. ...	old land	Morrel and mallee	July	Good	Mouldboard	4	Rigidtyne cultivated in October and again at end of March after rain; planted with combined cultivator drill	Geeralying	3rd week June	50	105	Copper carbonate	Yes	

ROYAL AGRICULTURAL SOCIETY.

Only one competitor, viz., J. R. Bremner & Sons, of Corrigin, in this zone, entered direct with the parent body.

The rainfall as recorded at Corrigin was as follows:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Corrigin	52	...	46	75	380	119	358	411	133	390	1,791	...	14	1,978

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	District.	Society.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Bremner, J. R., & Sons	Corrigin ...	Royal ...	Waratah	32	9	7	14	13	75

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.
Bremner, J. R. & Sons	5th crop	Gimlet, salmon, mallee	March, 1931	Dry but friable	Rigidtyne scarifier	in. 3	Rigidtyne cultivated in June; springtyne cultivated in August and again in Sept. Planted with combined cultivator drill. Harrowed immediately after seeding.

Competitor.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Bremner, J. R. & Sons ...	Waratah	1st week May	lb. 45	lb. 100	Copper carbonate	Yes	Flag Smut and traces of Flying Smut and Take-all

ZONE 8.

Judge—N. Davenport, Agricultural Adviser.

Royal Society—2 competitors.

Wickepin Society—5 competitors.

Gnowangerup Society—13 competitors.

Total—20 competitors.

WICKEPIN AGRICULTURAL SOCIETY.

The rainfall as recorded at Wickepin was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	J .	July.	Aug.	Sep.	Oct.	Total.			
Wickepin ...	130	...	75	179	464	164	414	428	78	334	1,877	1	7	2,269

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Fleay, C.	Wickepin ...	Graham ...	37	9	8	13	13	80
Elliott Bros. ...	Cliffordville...	Free Gallipoli	35	9	8	14	13	79
Hosken Bros. ...	Wickepin ...	Free Gallipoli	28	8	8	13	12	69
Miller, G.	Wickepin ...	Improved Rajah	21	8	8	14	12	63
Clifford, M. ...	Cliffordville...	Waratah ...	16	7	9	14	11	57

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lb.	lb.			
Fleay, C. ...	New land	Yorkgum, manna, morrel	August	Wet	Mouldboard	4	Planted with combined cultivator drill	Graham	1st week May	50	61	Copper carbonate	Yes	Take-all
Elliott Bros....	3	Yorkgum & jam	Early July	Good	Mouldboard	3-4	Springtyne cultivated Oct. and prior to drilling. Planted with disc drill	Free Gallipoli	3rd week April	45	90	*Nil* ...	Yes	Take-all and Flag Smut
Hosken Bros.	Old land	Morrel and mallee	Early July	Good	Mouldboard	4	Springtyne cultivated Sept. and April. Planted with combined cultivator drill with light harrows attached	Gallipoli	1st week May	60	112	Formalin	Yes	Little Take-all
Miller, G. ...	Old land	Morrel and mallee	July	Good	Disc ...	4½-5	Springtyne cultivated Oct. and twice in April. Planted with combined cultivator drill with light harrows attached	Improved Rajah	3rd week May	60	110	Copper carbonate	Re-cleaned	Take-all
Clifford, M. ...	2	Yorkgum and jam	Sept.	Boggy	Mouldboard	4	Springtyne cultivated prior to planting with disc drill	Waratah	End April	60	90	Copper carbonate	Yes	Flag Smut

GNOWANGERUP AGRICULTURAL SOCIETY.

The rainfalls as recorded at Gnowangerup and Borden were as follows:—follow:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Gnowangerup ...	138	27	71	169	292	203	362	198	133	224	1,412	42	8	1,867
Borden	118	93	59	151	185	218	270	206	175	209	1,263	3	15	1,702

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Cockram, C. E. ...	Gnowangerup	Free Gallipoli	45	9	9	14	14	91
McDonald, J. ...	Gnowangerup	Bencubbin ...	42	9	9	14	14	88
Stewart, W. B. ...	Gnowangerup	Yandilla King	40	9	8	14	14	85
Wellard & Wellard	Gnowangerup	Yandilla King	38	8	8	14	13	81
Beeck, H. O. ...	Gnowangerup	Yandilla King	37	9	9	14	12	81
Davis, N. P. ...	Gnowangerup	Yandilla King	35	9	9	14	14	81
Murray, G. ...	Borden ...	Yandilla King	34	9	8	14	13	78
Mianelup Estate ...	Gnowangerup	Nabawa ...	30	8	8	14	13	73
White, R. H. ...	Pallinup ...	Yandilla King	29	9	8	14	13	73
Gaze, W. O. ...	Kebaringup	Nabawa ...	29	9	8	14	13	73
Wright, E. H. ...	Pallinup ...	Yandilla King	28	9	9	14	13	73
White, A. J. ...	Pallinup ...	Yandilla King	28	9	9	14	12	72
Formby, R., & Co.	Gnowangerup	Yandilla King	29	8	8	14	12	71

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lb.	lb.			
Cockram, C. E.	Old land	York gum	Late June	Good	Mouldboard	3	Springtyne cultivated Aug., late Sept., and end April. Planted with combined cultivator drill with light harrows attached	Free Gallipoli	1st week June	55	112	Copper carbonate	Yes	Trace Take-all
McDonald, J.	Old land	Salmon and yorkgum	July	Good	Mouldboard	3½	Springtyne cultivated late Sept., and early Oct., and harrowed; Springtyne cultivated again during Feb., and April after rain and prior to seeding with combined cultivator drill with light harrows attached	Bencubbin	4th week June	55	100	Copper carbonate	Yes	Trace of Rust
Stewart, W. B.	Old land	Yorkgum and morrel	Late June	Good	Mouldboard	3	Springtyne cultivated 1st week Sept., mid Oct., mid Dec., and mid April. Planted with combined cultivator drill with light harrows attached	Yandilla King	last week May	48	120	Vitrioline	Yes	Take-all
Wellard & Wellard	Old land	Salmon and manna gum	Late Aug.	Fair	Mouldboard	3	Disc cultivated end Sept. Springtyne cultivated April and prior to seeding. Planted with combined cultivator drill with light harrows attached	Yandilla King	3rd week May	45	90	Copper carbonate	Yes	Take-all and Rust
Beeck, H. O.	Old land	Salmon and manna gum	Late Aug.	Good	Mouldboard	3	Cultivated with rigidtyne scarifier 3in. deep in July prior to ploughing. Harrowed early Aug.; cultivated with rigidtyne scarifier end Oct., and with springtyne cultivator early May. Planted with combined cultivator drill with light harrows attached	Yandilla King	1st week June	45	80	Copper carbonate	Yes	Take-all

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.				lb.	lb.			
Davis, N. P.	Old land	Yorkgum and morrel	July	Good	Mouldboard	3–3½	Springtyne cultivated early Oct., and in Autumn after rain. Planted with combined cultivator drill	Yandilla King	1st week June	35	112	Copper carbonate	Yes	Take-all and trace Rust
Murray, G. ...	2	Morrel	Late July	Fair	Mouldboard	3–4	Springtyne cultivated Sept., Nov., and April. Planted with combined cultivator drill	Yandilla King	last week May	52	96	Copper carbonate	Yes	Take-all
Mianelup Estate	Old land	Poot	June	Good	Disc ...	4	Disc cultivated end Sept. and springtyne cultivated shortly after and again in April. Planted with combined cultivator drill with light harrows attached	Nabawa	1st week June	60	110	Copper carbonate	Yes	Take-all
White, R. H.	Old land	Morrel	June	Good	Mouldboard	4	Springtyne cultivated end Aug., Sept., Oct., and April. Planted with combined cultivator drill with light harrows attached	Yandilla King	last week May	55	112	Copper carbonate	Yes	Take-all
Gaze, W. O.	Old land (lucerne pasture)	Yorkgum, morrel and mort	July	Hard	Disc ...	4–5	Disc cultivated Jan., after 2in. rain. Springtyne cultivated Feb. Planted with combined cultivator drill	Nabawa	3rd week June	52	90	Copper carbonate	Yes	Take-all and trace loose Smut
Wright, E. H.	New land	Yorkgum and morrel	July	Good	Disc cultivating plough	2½–3	Cross worked with disc cultivating plough end Sept. Springtyne cultivated March. Planted with combined cultivator drill with light harrows attached	Yandilla King	Mid-May	50	80	Copper carbonate	Yes	Trace Take-all and Rust
White, A. J.	Old land	Morrel and yorkgum	July–Aug.	Fair	Mouldboard	4	Springtyne cultivated Oct. and early May. Planted with combined cultivator drill with light harrows attached	Yandilla King	4th week May	50	90	Copper carbonate	Yes	Take-all
Formby, R. & Co.	Old land	Salmon gum and little mort	July	Fair	Mouldboard	3½	Springtyne cultivated early Oct. and April. Planted with combined cultivator drill with light harrows attached	Yandilla King	3rd week May	47	85	Copper carbonate	Yes	Take-all and Rust

ROYAL AGRICULTURAL SOCIETY.

The rainfalls as recorded at South Caroling and Borden, the location of the two competitors entering direct with the above Society, were as follow:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
South Caroling ...	16	...	23	63	488	115	351	392	79	502	1,927	...	3	2,032
Borden	118	93	59	151	185	218	270	206	175	209	1,263	3	15	1,702

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Richards, A. ...	Sth. Caroling	Gluclub ...	41	9	9	13	13	85
Illawarra Co. ...	Borden ...	Nabawa ...	34	9	9	14	14	80

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.
						in.	
Richards, A. ...	Old land	York gum, gimlet and morrel	June	Good	Mouldboard	3¼–4	Springtyne cultivated Sept. and Oct., followed by harrows; planted with combined cultivator drill
Illawarra Pastoral Co.	Old land	Morrel	July	Good	Mouldboard	4	Disc cultivated Oct. Springtyne cultivated Mar., after rain, and again prior to seeding Planted with hoe drill

Competitor.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
			lb.	lb.			
Richards, A. ...	Gluclub	1st week June	52	120	Copper carbonate	Yes	
Illawarra Pastoral Co.	Nabawa	3rd week June	60	140	Copper carbonate	Yes	Trace Take-all

ZONE 9.

Judge—L. G. Seinor, Manager Salmon Gums Experiment Farm.

Southern Mallee Society—23 competitors.

Phillips River Society—5 competitors.

Total—28 competitors.

SOUTHERN MALLEE AGRICULTURAL SOCIETY.

The rainfalls as recorded at the respective centres were as follow:—

	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Scaddan	81	22	145	355	56	233	153	277	165	238	1,122	25	44	1,794
Grass Patch ...	71	9	119	129	73	213	150	216	83	321	1,056	65	43	1,492
Red Lake ...	67	14	107	141	137	176	116	185	78	326	1,018	44	37	1,428
Circle Valley ...	55	11	111	112	76	159	147	187	78	361	1,008	29	45	1,371
Salmon Gums ...	52	13	88	79	89	152	149	197	77	326	990	21	60	1,303
Dowak	50	14	92	91	142	127	152	179	53	310	963	34	57	1,301
Kumarl	61	11	106	†	112	128	163	197	40	341	981	†	†	*1,159

* Total to 31st October, excluding April. † Returns not available.

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Haywood, T. ...	East Dowak	Gluyas Early	34	9	9	14	14	80
Clarke, A. T. ...	East Dowak	Gluyas Early	33	9	9	14	14	79
Maidment, A. ...	Salmon Gums	Gluyas Early	27	9	8	13	13	70
Talcon & Vosnacos	Salmon Gums	Gluyas Early	27	9	9	12	13	70
Sharpe, H. ...	Treslove ...	Nabawa ...	26	8	8	14	13	69
Johnston, J. ...	West Dowak	Gluyas Early	25	8	9	13	14	69
Grigg Bros. ...	Scaddan ...	Bencubbin ...	26	8	8	13	13	68
McCrea, N. J. ...	East Dowak	Gluyas Early	24	9	8	14	13	68
McCrea, W. F. ...	East Dowak	Noongaar ...	24	9	9	13	13	68
Thomas Bros. ...	Salmon Gums	Gluyas Early	23	8	9	13	13	66
Richie, D.	Grass Patch	Nabawa ...	24	8	8	13	12	65
O'Keefe, M. ...	West Dowak	Gluyas Early	24	8	9	12	12	65
Flintham, C. ...	Scaddan ...	Nabawa ...	23	8	8	13	13	65
Bassett, J. ...	Salmon Gums	Gluyas Early	23	8	9	12	13	65
Patterson, R. ...	Scaddan ...	Nabawa ...	23	8	8	12	13	64
Dunne, T.	Kumarl ...	Noongaar ...	19	9	9	13	14	64
Webster, J. ...	Treslove ...	Gluyas Early	22	8	8	13	12	63
Dowling, C. F. ...	Grass Patch	Gluyas Early	21	8	8	13	13	63
McCosh, J. ...	Kumarl ...	Gluyas Early	23	7	8	12	12	62
Waters, T. ...	West Dowak	Gluyas Early	21	8	8	12	12	61
Sedgwick, N. ...	Red Lake ...	Nabawa ...	19	8	8	13	13	61
Chapman, F. ...	West Dowak	Gluyas Early	19	8	9	13	12	61
Cooksey, F. ...	Beete ...	Gluyas Early	20	8	8	13	12	61

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent cultivations.	Variety.	When planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.					lb.	lb.		
Haywood, T.	New land	Silver bark, salmon and gimlet	July	Good	Disc	3-4	Springtyne cultivated ahead of drill	Gluyas Early	1st week May	39	93	Dry	Yes	No
Clarke, A. E. F.	New land	Merrit and gimlet, mallee	Oct., and Nov.	Dry	Disc	3	Cultivated ahead of drill	Gluyas Early	2nd week May	45	90	Dry	No	No
*Maidment, A.														
Talcon and Vosnacos	New land	Whipstick and gimlet, mallee	July	Good	Disc	3-4	Springtyne cultivated ahead of drill	Nabawa	Middle May	45	112	Dry	Yes	Flag Smut
Grigg Bros.	New land	Light mallee and scrub	June-July	Good	Disc	3-4	Cross ploughed ahead of drill at seeding time	Bencubbin	Early May	45	100	Dry	Yes	Rust
Sharpe, H. ...	New land	Light scrub and mallee	July	Good	Disc	3-4	Cross cultivated in April, and again ahead of drill	Nabawa	Early May	45	83	Dry	No	Rust and Flag Smut
Johnston, J. F.	New land	Gimlet and silver bark	June	Good	Disc	3-4	Cross ploughed and cultivated ahead of drill	Gluyas Early	Middle May	40	90	Dry	No	No
McCrea, N. J.	1st crop	Silver bark and gimlet	June-July	Good	Disc	3-4	Cultivated ahead of drill	Gluyas Early	May	40	90	Dry	Yes	
Flintham, C. B.	New land	Black mallee and light scrub	June-July	Good	Disc	3-4	Cross cultivated ahead of drill	Nabawa	Early May	55	90	Dry	No	Rust
McCrea, W. F.	2nd crop	Silver bark	July	Good	Disc	3-4	Cultivated ahead of drill	Noongaar	May	45	90	Dry	Yes	
Richie, D. ...	New land	Silver bark and mallee	Aug.	Good	Disc	3-4	Cross ploughed ahead of drill	Nabawa	15th May	45	112	Dry	Yes	Rust
Patterson, A. B.	New land	Light mallee	July	Good	Disc	3-4	Cross ploughed ahead of drill	Nabawa	Early May	45	95	Dry	Yes	
Cooksey, F. ...	New land	Black mallee	Aug.	Fair	Disc	3-4	Cultivated ahead of drill	Gluyas Early	Middle May	45	90	Dry	Yes	

* Particulars not available.

CULTURAL DETAILS—*continued.*

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
						in.					lb.			
McCosh, J. ...	New land	Blackbutt and gimlet	June-July	Good	Disc	3–4	Cross ploughed ahead of drill	Gluyas Early	Middle May	45	100	Dry	Yes	
Webster, J. ...	New land	Light mallee	June	Good	Disc	3–4	Cultivated ahead of drill	Gluyas Early	15th May	45	80	Dry	Yes	
Bassett, J. ...	New land	Mallee and silver bark	June	Good	Disc	3–4	Harrowed and cultivated in Sept. and Oct., and ahead of drill	Gluyas Early	Middle May	45	90	Dry	Yes	
Thomas Bros.	New land	Silver bark and mallee	July	Good	Disc	3–4	Cultivated Feb., and again ahead of drill	Gluyas Early	April	45	90	Dry	Yes	
O'Keefe, M. ...	New land	Mallee, merrit, tea-tree	July	Good	Disc	3–4	Ploughed ahead of drill	Gluyas Early	Middle May	45	90	Dry	Yes	Flag Smut
Dowling, C. F.	New land	Tea-tree, and black mallee	July	Good	Disc	3–4	Cross sundercut ahead of drill	Gluyas Early	Middle May	45	80	Dry	No	
Waters, T. ...	2nd crop	Silver bark	June-July	Good	Disc	3–4	Cultivated and harrowed October and harrowed ahead of drill	Gluyas Early	15th May May	45	80	Dry	Yes	
Selgwick, N.	New land	Whitegum and scrub	August	Dry	Disc	4	Cross ploughed ahead of drill	Nabawa	1st May	45	85	Dry	No	Flag Smut
Dunne, T. ...	New land	Gimlet, merrit and tea-tree	June	Good	Disc	3–4	Cultivated September and harrowed ahead of drill	Noongaar	Middle May	45	90	Dry	Yes	
Chapman, F.	New land	Mallee and silver bark	July	Good	Disc	3–4	Cultivated ahead of drill	Gluyas Early	Middle May	42	60	Dry	Yes	

PHILLIPS RIVER AGRICULTURAL SOCIETY.

The rainfall as recorded at Ravensthorpe was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Ravensthorpe ...	147	77	113	193	206	198	145	235	167	430	1,381	62	7	1,980

The awards made and the cultural details are as set out below:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Love, W. J. ...	Ravensthorpe	Ford ...	35	9	9	14	14	81
Campbell, J. ...	Ravensthorpe	Gluyas Early	29	8	9	13	13	72
Barrett Bros. ...	Ravensthorpe	Noongaar ...	23	8	8	13	13	65
Bebbington Bros. ...	Ravensthorpe	Gluyas Early	22	8	8	12	12	62
Chamber Bros. ...	Ravensthorpe	Merredin ...	21	7	8	13	12	61

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Disease.
						in.								
Love W. J. ...	3rd year	Heavy salmon gum	June–July	Good	Mouldboard	3–4	Springtyne cultivated August and ahead of drill	Ford	1st week May	38	65	Dry	Yes	No
Campbell, J....	2nd year	Jam, salmon gum and wattle	June	Good	Mouldboard	3 4	Springtyne cultivated March and again ahead of drill	Gluyas Early	Last week May	45	90	Dry	Yes	Flag Smut
Barrett Bros.	...	Salmon gum and mallee	June	Good	Disc	3–4	Springtyne cultivated August and Sept., and ahead of drill	Noongaar	1st week June	50	112	Dry	Yes	
Bebbington Bros.	...	...	June–July	Good	Mouldboard	3–2		Gluyas Early	May	45	100	Dry	Yes	
Chamber Bros.	3rd crop	Mallee and gimlet	July	Good	Mouldboard	3–4	Springtyne cultivated August and again ahead of drill	Merredin	Early May	45	65	Dry	Yes	

ROYAL AGRICULTURAL SOCIETY—ZONE CHAMPIONSHIP AWARDS.

Representatives from District Agricultural Societies' Competitions and entries received direct by the Royal Agricultural Society:—

Competitor.	Address.	Society.	Variety.	Yield.	Freedom from weeds.	Freedom from disease.	Freedom from admixture.	Evenness of growth.	Total.
				50 pts.	10 pts.	10 pts.	15 pts.	15 pts.	100 pts.
ZONE 1.—Judge F. L. SHIER, Agricultural Adviser.									
Forrister, J. K....	Carnamah ...	Carnamah ...	Gluyas Early	40	8	9	14	14	85
Hebiton, J. K. ...	Three Springs	Three Springs	Bena ...	37	9	9	13	14	82
Morecombe, P. T.	Coorow ...	Carnamah ...	Gluyas Early	34	9	9	13	13	78
Lynch, Senator P.	Mt. Leonora	Three Springs	Glucub ...	34	8	9	13	13	77
ZONE 2.—Judge J. H. LANGFIELD, Manager, Merredin Experiment Farm.									
Butcher, O. ...	Dalwallinu ...	Dalwallinu ...	Gluclub ...	42	9	9	13	14	87
Moore, T. ...	Indarra ...	Royal ...	Bencubbin ...	39	9	10	14	14	86
Locke, T. C. ...	Dalwallinu ...	Dalwallinu ...	Bencubbin ...	36	8	10	14	13	81
ZONE 3.—Judge N. DAVENPORT, Agricultural Adviser.									
Mt. Rupert Co. ...	Wongan Hills	Royal ...	Merredin ...	37	9	8	14	14	82
Jones, W. W. ...	Cowcowing ...	Royal ...	Bencubbin ...	36	9	9	14	13	81
Lane, W. H. & V. R.	Wongan Hills	Royal ...	Ford ...	34	8	8	13	13	76
Woodfield, N. H. C.	Goomalling...	Royal ...	Bena ...	31	9	8	14	12	74
ZONE 4.—Judge : G. L. THROSSELL, Agricultural Adviser,									
Creagh, Bros. ...	Kwelkan ...	Nungarin ...	Gluyas Early	33	9	8	13	13	76
Evans, L. D. ...	Nukarni ...	Nungarin ...	Bencubbin ...	30	9	8	14	13	74
Hopwood, B. W. G.	Bencubbin ...	Mt. Marshall	Bencubbin ...	27	8	8	14	13	70
Smith, P. J. ...	Turkey Hill	Southern Cross	Noongaar ...	22	8	8	13	13	64
Stevens, G. K. ...	Ghooli ...	Southern Cross	Bencubbin ...	18	9	9	14	12	62
Thompson, M. A.	Bencubbin ...	Mt. Marshall	Gluyas Early	17	7	6	14	11	55
ZONE 5 : Judge R. P. ROBERTS, Agricultural Adviser.									
Kay, J.	Baandee ...	Merredin ...	Gluclub ...	40	8	8	12	14	82
Smith & Sons ...	Bungulluping	Bruce Rock	Gluclub ...	37	9	9	13	13	81
Teasdale, F. O. ...	Korbel ...	Merredin ...	Bencubbin ...	36	8	8	14	13	79
Hammond, J. D.	Kellerberrin	Royal ...	Bencubbin ...	30	8	8	14	13	73
Smith, C. & A. H.	Yalbarrin ...	Bruce Rock	Gluclub ...	32	8	7	13	13	73
ZONE 7.—Judge : A. S. WILD, Agricultural Adviser.									
Freebairn, F. S....	Jilakin ...	Kulin ...	Gluclub ...	47	9	8	13	13	90
Trotter, A. W. ...	Kulin ...	Kulin ...	Bena ...	41	8	9	14	13	85
Stephens, F. ...	South Lake Grace	Lake Grace...	Waratah ...	38	9	8	14	14	83
Trestrail, S. J. ...	Karlgarin ...	Karlgarin ...	Gluclub ...	36	9	8	14	14	81
Bishop, H. J. ...	Lake Grace...	Lake Grace...	Waratah ...	36	9	8	13	14	80
English, C. ...	Sth. Kukerin	Kukerin ...	Yandilla King	36	9	8	13	14	80
Smith, W. G. ...	Kondinin ...	Karlgarin ...	Ford ...	36	8	9	13	14	80
Bremner, J. R. & Sons	Corrigin ...	Royal ...	Waratah ...	32	9	7	14	13	75
Bahr, E. O. ...	Sth. Kukerin	Kukerin ...	Yandilla King	31	8	8	13	14	74
Murray, A. ...	Tinkurrin ...	Harrismith ...	Canberra ...	25	9	8	14	14	70
Norton, J. ...	Tinkurrin ...	Harrismith ...	Bena ...	27	8	8	13	13	69
ZONE 8.—Judge : N. DAVENPORT, Agricultural Adviser.									
Cockram, C. E. ...	Gnowangerup	Gnowangerup	Free Gallipoli	45	9	9	14	14	91
McDonald, J. ...	Gnowangerup	Gnowangerup	Bencubbin ...	42	9	9	14	14	88
Richards, A. ...	Sth. Caroling	Royal ...	Gluclub ...	41	9	9	13	13	85
Illawarra Co. ...	Borden ...	Royal ...	Nabawa ...	34	9	9	14	14	80
Fleay, C. ...	Wickepin ...	Wickepin ...	Graham ...	37	9	8	13	13	80
Elliott Bros. ...	Cliffordville...	Wickepin ...	Free Gallipoli	35	9	8	14	13	79
ZONE 9.—Judge : L. G. SEINOR, Manager, Salmon Gums Experiment Farm.									
Love, W. J. ...	Ravensthorpe	Phillips River	Ford ...	35	9	9	14	14	81
Haywood, T. ...	E. Dowak ...	Southern Mallee	Gluyas Early	34	9	9	14	14	80
Clarke, A. T. ...	E. Dowak ...	Southern Mallee	Gluyas Early	33	9	9	14	14	79
Campbell, J. ...	Ravensthorpe	Phillips River	Gluyas Early	29	8	9	13	13	72

OBJECTS OF THE COMPETITION.

The object of the competition is the improvement of the standard of wheat farming methods practised throughout the wheat belt. A spirit of healthy rivalry is engendered and competitors and others set themselves to follow those more successful than themselves. The methods practised by all the competitors are tabulated, the good farmers of the State receive recognition of their ability, and consequently a standard of practical wheat farming is established. It is demonstrated that, where recommended methods are employed, reasonable success follows. The competitions also afford the officers of the Department of Agriculture opportunities to come into personal contact with the farmers.

THE SEASON.

The opening of the 1932 season was an unfavourable one. After general rains of a rather light nature in mid-April registrations were not again general until the end of May. The opening rains were not sufficient for a complete moistening of the seed bed and upper subsoil, and owing to the particularly prolonged dry spell which followed germination of the early sown crops was patchy, and in some cases malting occurred.

The greater proportion of the crops was seeded dry, and for this reason weed control was not as effective as was desired. After the late May rains germination was good, and the growing season continued satisfactorily as the result of good general falls during the winter months.

There occurred from July onwards, and especially in the outer drier areas, a series of frosts which in these districts in many cases caused considerable damage.

General rains continued into October, and these were very beneficial in all districts. As the result of the late start and these late rains the season ended a fortnight or so later than usual.

ENTRIES.

The total number of crops competing for the zone championship awards in the different zones was 168, a considerable increase over the number of entries for the previous year, viz., 110.

Entries were received from 17 District Agricultural Societies and 9 entries were received direct by the Royal Agricultural Society. In addition, local competitions were conducted by the Bruce Rock and Phillips River Agricultural Societies, and also by the Wialki-Bonnie Rock Settlers' Association. These local competitions included 19 competitors, making a total of 187 crops inspected in all.

The following table shows the progress of the competition since its inception in 1921:—

Year.	No. of District Agricultural Societies competing.	No. of competitors.	Average Yield of competitors.	Average Yield for State.
			bush.	bush.
1921	...	15	25	10·4
1922	...	32	24	8·9
1923	12	82	29	11·4
1924	15	70	31	12·8
1925	18	59	22·5	9·7
1926	11	99	24·5	12·0
1927	10	100	26·9	12·1
1928	13	114	22·5	10·1
1929	12	156	21·7	11·0
1930	15	165	27·4	13·3
1931	13	110	27·4	13·1
1932	17	168	29·3	11·4*

* Estimate. District Agricultural Societies did not compete until 1923.

It will be seen from the above table that absolute records for the number of competing societies and number of competitors were established, while the average yield of all competitors, viz., 29.3 bushels per acre, has been bettered on one occasion only, viz., in 1924, when an average of 31 bushels was obtained.

Varieties.

This year the pride of place for the favourite variety has been won by the standard variety Gluyas Early, being planted by 42 competitors. Nabawa comes next and was planted by 16. The previous year the position was reversed, the numbers being Nabawa 31, Gluyas Early 13. This is to some extent due, no doubt, to the late germination of the crops with the consequent handicap to the later maturing varieties. The figures for the remaining varieties are Bencubbin 14, which appears to be fast displacing Nabawa in this respect, Gluclub 14, Yandilla King 12, Merredin, Bena, and Waratah with 9 each, Noongar 8, Free Gallipoli 7, Ford 5, Gluyas Late 4, Geeralying 3, Carrabin, Pusa, Canberra, and Baroota Wonder Early with 2 each, and Felix, S.H.J., German Wonder, Nizam, Sailor's Fortune, Queen Fan, Graham, and Improved Rajah were represented by one competitor each.

It will be seen that the standard recommended varieties were entered by the majority of competitors.

Three zone championships were won by the variety Gluclub, two with Gluyas Early, and one each with Merredin, Free Gallipoli, and Ford.

The variety Gluclub established a State record yield of 47 bushels per acre, and which had previously been held by the variety Yandilla King with a yield of 46 bushels per acre.

Time of Seeding.

This is one of the most important factors for the successful production of the wheat crop. The seeding season is a comparatively short one, and as it is known that some varieties are more suitable for early planting, others for mid-season, and others again for late planting, the seeding operations should be so arranged that the varieties selected are planted as near as possible to their optimum, *i.e.*, best seeding period.

The effect of seeding out of season was not so marked for the past crop inasmuch as the main germination took place at the end of May and in early June, due to the long dry spell during the main seeding month of May. It must be borne in mind that last season was quite an abnormal one, and farmers should not deviate from the calendar based on the expectations over a number of years.

75 per cent. of the crops were planted in May and 5 per cent. in April.

The late sown crops were located chiefly in the heavier rainfall districts where the seeding period is later and where rainfall during the spring months is more plentiful.

Of the 168 crops in the competition, 22 were late maturing varieties, 76 were mid-season varieties, and the remaining 70 were of early and very early maturing varieties.

Rates of Seeding.

The rates of seeding varied from 24 lbs. to 75 lbs. per acre, with an average of 47 lbs. The majority of the competitors planted between the rates of 45 lbs. and 60 lbs. per acre.

Experimental results indicate that for the mid-season and early districts, while the yield is not decreased by heavier rates of seeding, no advantage is gained by increasing the amount over 45 lbs. per acre. In the very early districts, however, the lighter rates of seeding are more suitable. For the late, *i.e.*, heavy rainfall districts, heavier rates can be practised often with advantage, particularly when trouble from weed growth is anticipated.

Rates of Superphosphate.

Superphosphate was applied by all but one competitor, the average rate of application being 89 lbs. per acre, an increase of 4 lbs. upon the previous year's average.

The majority of the competitors used rates ranging between 80 lbs. and 100 lbs. per acre.

The rate of application of superphosphate has been gradually increasing in most districts. This has been partly due, no doubt, to the fact that the leading competitors have taken advantage of the results of the experiments at the various Experiment Farms and have obtained profitable results by applying the heavier dressings.

Yields.

Since 1925 the Royal Agricultural Society has awarded a special prize of £5 5s. to the competitor who obtains the highest calculated bushel yield per acre from the competing area of 50 acres. The award this year has been made to Mr. F. S. Freebairn, of Jilakin, near Kulin, whose competing area of the variety Gluclub was calculated to yield 47 bushels per acre. Ths yield, as previously mentioned, also establishes a record yield for this competition, the previous holder being Mr. C. E. Cockram, of Pallinup, with a yield of 46 bushels per acre from the variety Yandilla King.

The winners of the prize to date are as follow:—

1925—Hebiton & Sons, Three Springs, Nabawa, 34 bushels per acre.

1926—Cuming Bros., Carnamah, Yandilla King, 38 bushels per acre.

1927—A. W. Parkinson, Gnowangerup, Yandilla King, 40 bushels per acre.

1928—A. W. Parkinson, Gnowangerup, Yandilla King, 40 bushels per acre.

1929—C. E. Cockram, Pallinup, Yandilla King, 46 bushels per acre.

1930—C. Smith & Sons, Yarding, Gluclub, 43 bushels per acre.

1931—H. O. Beeck, Gnowangerup, Yandilla King, 42 bushels per acre.

1932—F. S. Freebairn, Jilakin, Gluclub, 47 bushels per acre.

This year 125, or 80 per cent. of the crops were calculated to yield 25 bushels or over per acre, 72 or 43 per cent. to yield 30 bushels and over, and 35 or 21 per cent. to yield 35 bushels and over. The corresponding percentages last year were 65 per cent., 36 per cent., and 15 per cent. respectively.

Those competitors obtaining 35 bushels or over per acre are as tabulated below:—

Zone.	Competitor.	District.	Society.	Variety.	Yield.
					bush.
7	Freebairn, F. S. ...	Jilakin	Kulin	Gluclub	47
8	Cockram, C. E. ...	Gnowangerup ...	Gnowangerup ...	Free Gallipoli ...	45
2	Butcher, O.	Dalwallinu	Dalwallinu	Gluclub	42
8	McDonald, J.	Gnowangerup ...	Gnowangerup ...	Bencubbin	42
8	Richards, A.	South Caroling ...	Royal	Gluclub	41
7	Trotter, A. W. ...	Kulin	Kulin	Bena	41
1	Forrester, J. K. ...	Carnamah ...	Carnamah	Gluyas Early ...	40
5	Kay, J.	Baandee	Merredin	Gluclub	40
8	Stewart, W. B. ...	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	40
2	Moore, T.	Indarra	Royal	Bencubbin	39
7	Purser, R. & Co. ...	Jilakin	Kulin	Gluclub	39
7	Scadding, N. A. ...	Jilakin	Kulin	Gluclub	39
7	Stephens, F.	South Lake Grace	Lake Grace ...	Waratah	38
8	Wellard & Wellard ...	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	38
7	Bailey, G. A.	Kulin Rock ...	Kulin	Bena	37
8	Beeck, H. O.	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	37
8	Fleay, C.	Wickepin	Wickepin	Graham	37
1	Hebiton, J. K. ...	Three Springs ...	Three Springs ...	Bena	37
7	Henderson, Mrs. F. F....	Gnarming	Kulin	Queen Fan ...	37
3	Mt. Rupert Co. ...	Wongan Hills ...	Royal	Merredin	37
5	Smith, C. & Sons ...	Bungulluping ...	Bruce Rock ...	Gluclub	37
7	Bishop, H. J.	Lake Grace ...	Lake Grace ...	Waratah	36
7	English, C.	South Kukerin ...	Kukerin	Yandilla King ...	36
3	Jones, W. W.	Cowcowing ...	Royal	Bencubbin	36
2	Lock, F. C.	Dalwallinu	Dalwallinu	Bencubbin	36
7	Smith, W. G.	Kondinin	Karlgarin	Ford	36
5	Teasdale, F.	Korbel	Merredin	Bencubbin	36
7	Trestrail, S. J.	Karlgarin	Karlgarin	Gluclub	36
5	Barnet, L. T. C. ...	Walgoolan	Merredin	Gluyas Early ...	35
8	Davis, N. P.	Gnowangerup ...	Gnowangerup ...	Yandilla King ...	35
8	Elliott Bros.	Cliffordville ...	Wickepin	Free Gallipoli ...	35
7	James, S. W.	North Karlgarin ...	Karlgarin	Gluyas Early ...	35
9	Love, W. J.	Ravensthorpe ...	Phillips River ...	Ford	35
2	Sutherland Bros. ...	Dalwallinu	Dalwallinu	Gluyas Early ...	35
7	Treasure, C. W. ...	Karlgarin	Karlgarin	Bencubbin	35

The average calculated yield for all crops inspected was 29.3 bushels per acre, an average which has been exceeded on only one occasion, viz., in 1924, when 31 bushels per acre was obtained from 70 competitors.

The following table shows the comparison between the yields for the 1932 season and the previous five years:—

Zone.	No. of Competitors. 1932.	Average Calculated Yields.					
		1932.	1931.	1930.	1929.	1928.	1927.
1	13	32·1	33·5	28·2	24·7	29·0	28·0
2	8	33·4	26·0	27·6	22·5	19·3	22·4
3	4	34·5	32·5	27·5	23·4	21·3	25·6
4	20	22·8	25·2	26·1	18·2	18·3	29·2
5	15	31·3	28·0	32·7	21·9	20·4	26·2
7	60	29·8	21·8	28·6	22·0	23·0	25·6
8	20	32·8	31·9	30·0	32·2	31·0	32·0
9	28	24·3	23·3	19·8	14·5	...	...
	168	29·3	27·4	27·4	20·7*	22·5	26·9

* The results for 1929 included a number of local competitions planted on fallowed land. There were 156 competitors in the Royal and District competitions that year, the average being 21·7 bushels per acre.

It is to be hoped that the efforts of those who carefully prepared their land, and who harvested good returns therefrom, will stimulate others to do likewise. It must be remembered, however, that the test of efficient farming comes when our season is least favourable. It is then that sound methods prove their value.

FALLOWING.

The conditions of the competition required the crops to be sown on fallowed land. In the preparation of the fallows most of the competitors ploughed their land during the winter months of June to August. It has been definitely demonstrated that higher yields are obtained if the land is ploughed early in the fallowing season than when ploughed later. In this connection in an experiment conducted at the Merredin Experiment Farm for six years (1924-1929), the average yield of plots ploughed the first week in June was 3 bushels 51 lbs. more than those ploughed the last week in August.

The average depth of the initial ploughing was from three to four inches, mouldboard and disc ploughs being used for this operation, while in a few cases rigidtyne scarifiers and springtyne cultivators were utilised for the initial cultural operation. The advantages of using a particular type of implement are determined by the type and condition of the soil to be dealt with. Whether the disc or mouldboard is selected, it is essential that the work be done thoroughly.

For the subsequent working of the fallow in preparation of a seedbed, the springtyne cultivator was the implement chiefly used. A disc implement was favoured, however, when the ground was hard or weedy. The rigidtyne cultivator is also designed and is suitable for this purpose.

Sheep are becoming more numerous throughout the Wheat Belt each year, and their value in assisting to control weed growth on fallow is more widely appreciated.

Experiments at the various experiment farms have shown that increased yields were obtained when heavier dressings of superphosphate up to 150 lbs. were used, particularly on the lighter classes of soil.

The drastic change in the economic conditions of wheat farming, however, alters the interpretation of the results of these experiments because, where in the past more liberal dressings of superphosphate were profitable, this is not so to-day.

An analysis of the results of the rate of superphosphate with wheat experiments shows that when superphosphate is valued at £5 a ton and wheat at 2s. a bushel, the limit of profitable application for the heavy forest country appears to be reached with an application of 112 lbs. per acre, and on the light land, 120 lbs. per acre.

DISEASES.

Diseases found in the competition crops were Ball, Flag and Loose Smuts, Take-all and similar diseases (Foot Rot and Root Rot) and Septoria and Rust. Frost and wind injury were also observed.

Ball Smut.—Although not greatly in evidence, it is surprising to find this disease in competition crops. Though the number of infected crops is yearly diminishing, the economic loss to farmers from this and other preventable diseases is all too large. This disease can be prevented by the use of such fungicides as dry copper carbonate powder or the bluestone or formalin solutions. All are reliable fungicides, but of these by far the most popular is the dry copper carbonate dust. When correctly applied, at the rate of 1½ to 2 ounces per bushel, this method is very effective in preventing the disease. An added advantage with this method is that the seed wheat can be treated and stored immediately after harvest without any detrimental effect, and in addition the copper carbonate acts as a preventive against vermin. The presence of Ball Smut in a crop nowadays is not only indicative of faulty treatment, but also of "slipshod" methods. The results with this treatment have been so highly satisfactory that, where care is exercised and the seed thoroughly dusted, the disease can be entirely eliminated.

Flag Smut.—This disease is becoming more in evidence each year. This is probably due to the fact that a considerable number of farmers fail to recognise the disease when present in their crops. Consequently serious damage is caused before control steps are taken.

A wheat plant affected by Flag Smut has the leaves and leaf sheaths curled, twisted and distorted. Together with the stems, they develop long black streaks running parallel with the veins. The streaks are due to ruptures or slits caused by the fungus, and from these comes the black powder or smut from which the disease derives its name. The affected parts may become quite blackened, and the smut may even penetrate the hollow centres of the straw. Affected plants are either killed or stunted, and at close view show out quite distinctly among the taller healthy plants. Whole stools may be smutted or only some of the shoots, the remainder forming normal, but often undersized ears with little or no grain.

Unlike Ball Smut, where the chief source of infection is from spores on the seed, this disease is a soil infection. Spores from various agencies find their way into the soil, and remain there to attack the wheat crops. It can be seen, therefore, that its control lies not so much from seed treatment, but more along the lines of crop rotation. As a precaution all seed should be treated with dry copper carbonate, and while there is evidence that this diminishes re-infection to a limited extent, it will not control it. The most effective means of control of this disease are by cultural methods in conjunction with the growing of resistant wheats, and it is indeed fortunate that such a popular variety as Nabawa is Flag Smut resistant, as are also the late maturing varieties Yandilla King and Sutton. Other resistant wheats are Beneubbin, Carrabin, Geeralying, and Totadgin, all of which are recommended for planting on infected areas. Gluyas Early, Merredin and Canberra, all early varieties, are very susceptible to this disease.

A certain means of spreading infection throughout the farm is by feeding infected wheaten hay to stock. Oaten hay should be used, as in addition the growing of oats also assists in the control of the disease Take-all. Badly infested wheat stubbles may be burnt and so prevent stock spreading the spores over the farm, either through the agencies of the manure or by carrying it on their bodies. Early fallow and judicious cultivation to keep down weeds and self-sown wheat plants are essential. Where it is known that a paddock is infected, it is advisable to delay seeding until after the first seeding rains.

Briefly the methods of control are as follow:—

1. Fallow early and well.
2. Keep fallows free of weeds and self-sown wheat.
3. Plant resistant varieties.
4. Plant as late as is safe to plant in the sowing season.
5. Discontinue feeding infected hay to stock.
6. Include oats in the crop rotation.
7. Burn the stubble of badly infected crops.

Loose Smut.—Loose Smut or Flying Smut is more difficult to control, as there is no practical method of seed treatment. Seed from badly infected crops should be discarded, and fresh seed obtained from clean crops.

Take-all was very much in evidence this year. This disease is also the result of soil infection, and its control is very similar to that for Flag Smut. There is, however, no variety, as yet, known to be resistant to this disease, and its control

depends, therefore, on the farming practice adopted. In this respect the value of a crop of oats (free of barley or wheat) is of utmost importance.

It was not surprising to find that in some cases where competing crops were badly infested with Take-all, the reason was because no control methods had been taken. *Farmers are advised not to wait until their cropping areas become badly infected before taking steps to control these diseases, but to adopt preventive methods, which include the growing of oats in their cropping rotation.*

Rust.—This is a disease, the prevalence of which depends mainly on the seasonal conditions, over which there is no control. In districts where Rust is likely to occur, farmers should avoid growing rust-liable wheats.

Septoria.—The disease Septoria is most liable to occur when the wheat crop is planted too early. Under these conditions there is a tendency for the plants to make flaggy and rank growth, and as a result they become more susceptible to infection by the fungus. The control consists of seasonable planting and the practice of clean farming methods.

It is not possible in the space of this article to discuss the various diseases fully, but should any reader desire further information concerning these diseases, bulletins are available for free distribution, and can be obtained on application. The bulletins mentioned are—

Septoria, No. 121.
Rust of Cereals, No. 126.
Flag Smut, No. 134.
Cereal Smuts, No. 160.
Foot Rot and Root Rot of Wheat, No. 228.
Partial or complete emptiness in wheat heads, No. 301.
Earcockle and Bacterial Diseases of Wheat, No. 196.

The 50-acre crop competitions have proved invaluable for demonstrating the correctness of methods under varying conditions of soil and climate. When sound methods of farming are adopted, higher yields are made possible, and, under correct business management, the cost of production lowered.

DISTRICT CROP COMPETITIONS, 1932.

I. THOMAS, Superintendent of Wheat Farms.

In addition to the 50-acre crop competitions conducted by the Royal and District Agricultural Societies, competitions were also conducted by unaffiliated bodies or by agricultural societies who conducted competitions additional to those in connection with the parent body.

The District Agricultural Society of Phillips River conducted a 25-acre crop competition, and that of Bruce Rock conducted a 50-acre crop and fallow competition. A 50-acre crop competition was organised by the Wialki-Bonnie Rock Settlers' Association, although this differed from the two previously mentioned in that it was not a condition that the crop should necessarily be planted on fallowed land.

In all, there were 19 entries, the average yield for all competitors being 23.5 bushels per acre. The average yields for the competitors on fallowed and unfallowed land were as follows:—

Fallowed .. .. 25.1 bushels.
Unfallowed .. .. 16.8 bushels.

The judges' reports and awards, together with a detailed summary of the rainfall and cultural details are as follow:—

BRUCE ROCK AGRICULTURAL SOCIETY.

Judge—R. P. Roberts, Agricultural Adviser.

The above society commenced a fallow and crop competition in 1931 for which there were seven entries, the report on which appeared on page 108 of the March, 1932, issue of the *Agricultural Journal*.

In continuation of this competition, crops were to be planted last year on the fallow so entered, but only three of the original seven participated. The combined awards made by the judge for both sections were as follow:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from weeds. 10 points.	Freedom from disease. 10 points.	Freedom from admixture. 15 points.	Evenness of growth. 15 points.	Total. 100 points.	Fallow competition Awards. 100 points.	Total. 200 points.
Farrell, F. C. & Sons	Yarding ...	Bencubbin ...	32	8	7	12	12	71	90	161
Smith, C. & A. H.	Yalbarrin ...	Gluclub ...	30	7	7	13	11	68	91	159
Smith, C. & Sons	Yarding ...	Gluclub ...	31	7	7	13	12	70	86	156

The rainfall as recorded at Bruce Rock was as follows:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Bruce Rock ...	70	8	29	57	230	99	288	355	62	340	1,374	...	8	1,546

The cultural details were as follows:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Original timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Graded.	Diseases.
						in.				lb.	lb.		
Farrall, F. C. & Sons	Old land	Salmon gum, gimlet and a little mallee	Early June	Good	Mouldboard and disc	4	Half rigidtyne cultivated and balance disc cultivated in mid-August. Springtyne cultivated in Oct. and Jan. Springtyne cultivated last week in April	Bencubbin	7th–8th May	54	96	Yes	Take-all
Smith, C. and A. H.	Old land	Salmon gum, and gimlet	Early June	Good	Mouldboard	3	Springtyne cultivated in August–Sept. Rigidtyne scarified in October	Gluclub	1st week May	45	125	Yes	Take-all and a little flag smut
Smith, C. & Sons	Old land	Salmon gum and gimlet	July	Good	Disc	3	Disc cultivated Aug. and Sept.	Gluclub	2nd week May	48	90	Yes	Take-all and a little flag smut

WIALKI-BONNIE ROCK SETTLERS' ASSOCIATION.

Judge—N. DAVENPORT, Agricultural Adviser.

As the result of a generous donation by Mr. A. W. Bevan, Agricultural Bank Inspector for the district, a 50-acre crop competition was conducted with the object of improving the farming practice of this new area.

It was realised that if entries were limited to those planted on fallow, there would be too few participating, so for the first year only, crops planted both on fallowed and unfallowed land were allowed to compete. There were eight entries, the awards for which are set out below—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
Chamberlain & Pratt	Beacon ...	Nabawa ...	21	9	9	14	12	65
O'Neil, T. M. J. ...	Wialki ...	Noongaar ...	18	9	9	14	13	63
Baber, A.	Bonnie Rock	Nabawa ...	19	9	9	14	11	62
Broomhall, V. ...	Wialki ...	Gluyas Early	18	9	8	13	12	60
Caunt, F.	Bonnie Rock	Noongaar ...	18	8	9	13	12	60
Milligan Bros. ...	Wialki ...	Noongaar ...	17	9	9	12	13	60
Jackman, R. C. ...	Bonnie Rock	Noongaar ...	15	8	9	14	12	58
Barwise, P. ...	Wialki ...	Noongaar ...	14	7	8	13	13	55

The rainfalls recorded for Wialki and Bonnie Rock were as follow:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Wialki	46	56	107	63	129	113	179	298	36	168	923	...	50	1,245
North Wialki ...	34	75	95	77	181	109	198	380	36	215	1,119	...	...	1,400
Bonny Rock ...	77	97	90	102	124	117	188	337	44	168	978	...	60	1,404

The cultural details of the respective entries were as follow:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
Chamberlain & Pratt	New land	Mallee and teatree	Aug.	Good	Disc ...	in. 2	Planted with combined cultivator drill	Nabawa	3rd week April	lb. 45	lb. 90	Copper carbonate	Yes	
O'Neil, T. M. J.	2	Salmon gum, gimlet, mallee, white gum	...	...	...	...	Springtyne cultivated 2nd week May; planted with disc drill	Noongaar	1st week June	36	90	Copper carbonate	No	
Baber, A. ...	New land	Salmon gum, mallee, gimlet and scrub	June	Good	Disc ...	4	Springtyne cultivated prior to seeding with disc drill	Nabawa	2nd week May	45	76	Copper carbonate	Yes	
Broomhall, V.	New land	Salmon gum, gimlet, snap and rattle	Aug.	Fair	Disc ...	3	Springtyne cultivated in March; planted with combined cultivator drill	Gluyas Early	1st week May	32	60	Copper carbonate	Yes	
Caunt, F. ...	New land	Salmon gum, gimlet, snap and rattle	...	...	...		Springtyne cultivated March; planted with combined cultivator drill	Noongaar	3rd week June	38	75	Copper carbonate	No	
Milligan Bros.	New land	Salmon gum, and gimlet	...	...	...	...	Springtyne cultivated April; planted with combined cultivator drill	Noongaar	last week May	36	70	Copper carbonate	Yes	Ball Smut
Jackman, R. C.	New land	Salmon gum	June	Good	Disc cultivating plough	3–4	Planted with combined cultivator drill	Noongaar	2nd week June	37	45	Copper carbonate	No	
Barwise, P. ...	2	Salmon gum and gimlet	...	...	...	...	Springtyne cultivated early March. Planted with combined cultivator drill	Noongaar	last week May	45	60	Copper carbonate	Yes	Flag Smut

PHILLIPS RIVER AGRICULTURAL SOCIETY.

Judge—L. G. Seinor, Manager, Salmon Gums Experiment Farm.

In addition to the 50-acre crop competition conducted by the above society as a participant in the Royal Agricultural Society's Competition, a separate local 25-acre crop competition was also conducted. There were eight entries for the latter, the awards made being as follow:—

Awards.

Competitor.	Address.	Variety.	Yield. 50 points.	Freedom from Weeds. 10 points	Freedom from Disease. 10 points	Freedom from Admixture. 15 points	Evenness of Growth. 15 points.	Total. 100 points.
McCulloch, J. ...	Ravensthorpe	Merredin ...	37	9	9	14	14	83
Love, W. J. ...	Ravensthorpe	Ford ...	35	9	9	14	14	81
Campbell, J. ...	Ravensthorpe	Gluyas Early	29	8	9	13	13	72
Barrett Bros. ...	Ravensthorpe	Noongaar ...	23	8	8	13	13	65
Metz, E.	Ravensthorpe	Ford ...	22	8	8	13	12	63
Mitchell, C. J. ...	Ravensthorpe	Merredin ...	22	8	9	12	12	63
Bebbington Bros. ...	Ravensthorpe	Gluyas Early	22	8	8	12	12	62
Chamber Bros. ...	Ravensthorpe	Merredin ...	21	7	8	13	12	61

The rainfall recorded at Ravensthorpe is shown below:—

——	Jan.	Feb.	Mar.	Apl.	Growing Period.							Nov.	Dec.	Total for year.
					May.	June.	July.	Aug.	Sep.	Oct.	Total.			
Ravensthorpe ...	147	77	113	193	206	198	145	235	167	430	1,381	62	7	1,980

The cultural details of the respective competitiors are as follow:—

CULTURAL DETAILS.

Competitor.	No. of years cropped.	Timber.	When ploughed	Condition of land.	Implement.	Depth.	Subsequent Cultivations.	Variety.	When Planted.	Rate of seed.	Rate of super.	Seed treatment.	Graded.	Diseases.
McCullock, J.	...	Salmon gum and yate	July	Good	Disc	in. 3-4	Cross-ploughed Sept. and cultivated ahead of drill	Merredin	Late May-Early June	lb. 45	lb. 85	Dry	No	
Love, W. J. ...	3rd year	Heavy salmon gum	June-July	Good	Mouldboard	3-4	Springtyne cultivated August and ahead of drill	Ford ...	1st week May	38	65	Dry	Yes	No
Campbell, J....	2nd year	Jam, salmon gum and wattle	June	Good	Mouldboard	3-4	Springtyne cultivated March and again ahead of drill	Gluyas Early	Last week May	45	90	Dry	Yes	Flag Smut
Barrett Bros.	...	Salmon gum and mallee	June	Good	Disc	3-4	Springtyne cultivated August and Sept. and ahead of drill	Noongaar	1st week June	50	112	Dry	Yes	
Metz, E. ...	3rd year	Salmon gum, yate and mallee	July	Good	Disc	3 4	Cross-ploughed September	Ford ...	Middle-May	45	48	Dry	No	
Mitchell, C. J.	...	Mallee ...	July	Good	Mouldboard	3-4	Springtyne cultivated Sept., tandem disc cultivated October and February, and ahead of drill	Merredin	2nd week June	45	40	Dry	Yes	
Bebbington Bros.	...	...	June-July	Good	Mouldboard	3-4	...	Gluyas Early	May	45	100	Dry	Yes	
Chamber Bros.	3rd crop	Mallee and gimlet	July	Good	Mouldboard	3-4	Springtyne cultivated August and again ahead of drill	Merredin	Early May	45	65	Dry	Yes	

LIVE STOCK AND MEAT.

For the information of readers of this "Journal," the following particulars have been supplied by Messrs. Elder, Smith and Coy., Ltd., Perth:—

COMPARATIVE NUMBERS OF STOCK SOLD AT METROPOLITAN FAT STOCK MARKETS FOR MONTHS OF DECEMBER, 1932, JANUARY AND FEBRUARY, 1933.

	DECEMBER.			JANUARY.				FEBRUARY.			
	7.	14.	21.	4.	11.	18.	25.	1.	8.	15.	22.
Sheep	10,943	11,346	15,102	15,253	12,497	13,339	11,793	10,526	10,853	8,267	11,747
Cattle	451	483	728	651	610	612	374	436	501	440	544
Pigs	1,368	1,993	1,579	970	1,507	1,880	2,148	1,538	1,598	1,538	972

COMPARATIVE VALUES PER POUND.

Mutton	2½d.	2¾d.	3d.	3d.	3d.	2¾d.	2¾d.	2¾d.	2½d.	3d.	4d.
Beef	5d.	5¼d.	5¼d.	5d.	5d.	4¾d.	4¾d.	4¾d.	5d.	5¼d.	6d.
Pork	5¾d.	5¾d.	6d.	6¼d.	5¾d.	5¾d.	5¼d.	5d.	4d.	4d.	4¼d.
Bacon	4¾d.	4¾d.	4¾d.	4¼d.	4¼d.	4¼d.	4d.	4d.	3½d.	3½d.	3½d.

MARKET REPORT.

Messrs. H. J. Wigmore & Co., Ltd., of Wellington Street, Perth, have supplied us with the following information regarding the Chaff available for auction at the Perth Railway Yards, for the period December to February inclusive.

December.—1,010 tons of Chaff: F.a.q. to prime Wheaten Chaff was making from £3 17s. 6d. to £4; f.a.q. from £3 12s. 6d. to £3 15s. per ton. Medium quality sold at from £3 5s. to £3 7s. 6d. Prime Oaten Chaff was finding buyers at auction, and also selling to arrive at £3 15s. to £3 17s. 6d.; f.a.q. at around £3 12s. 6d. per ton.

Oats: Heavy supplies were arriving to a dull demand, and good heavy feeds were realising from 1s. 7d. to 1s. 7½d.; good feeds 1s. 5d. per bushel.

Wheat: In the early part of December f.a.q. was finding buyers from 3s. to 3s. 1d.; second grade from 2s. 6d. to 2s. 8d. per bushel.

January.—790 tons of Chaff: F.a.q. to prime Wheaten Chaff was selling at £4 2s. 6d. to £4 5s., several consignments of prime quality being knocked down at £4 10s. per ton. F.a.q. found buyers at £3 15s. There was very little alteration in the price of Oaten Chaff during the month, best samples making £3 17s. 6d. per ton; f.a.q. from £3 12s. 6d. to £3 15s. per ton.

Oats: Owing to short supplies coming forward the market for good heavy feed Oats firmed, this quality selling at from 1s. 10d. to 1s. 10½d.; good feeds at 1s. 6d. per bushel.

Wheat: At the beginning of the month f.a.q. was making 3s.; but towards the end of the month the market eased to 2s. 8d. per bushel. Second grade found buyers at from 2s. 4½d. to 2s. 5d.

February.—685 tons of Chaff. F.a.q. to prime Wheaten Chaff realised £4 10s., several trucks being knocked down at £4 12s. 6d. per ton. F.a.q. was making from £3 17s. 6d. to £4. Best samples of Oaten Chaff were selling at £4 per ton; f.a.q. from £3 12s. 6d. to £3 15s. per ton.

Oats: Good heavy feeds were finding buyers at from 1s. 10d. to 1s. 11d.; good feeds from 1s. 6d. to 1s. 9d. per bushel.

Wheat: F.a.q. made from 2s. 7d. to 2s. 8d., but towards the end of the month several consignments sold at from 2s. 10d. to 2s. 11d. per bushel. Second grade was realising from 2s. 4d. to 2s. 5d.

H. J. Wigmore & Co., Ltd., hold auction sales in the Perth Railway Yards, each morning, for Chaff, Grain and Potatoes, and all consignments forwarded to their care receive their best and prompt attention. The highest market prices with prompt returns are guaranteed.

Live Stock.

PRODUCERS' MARKETS CO-OPERATIVE LIMITED.

REPORT OF SALES FOR THE QUARTER ENDED 28th FEBRUARY, 1933.

Fruit.—Although stone fruit has been prolific, conditions have not been so difficult as might have been expected with the recurrence of the triennial stone fruit glut in a period of depression. This particularly as weather conditions throughout the summer (with the exception of only one week) have been unusually mild, consequently limiting demand. There has been evidence of greater care by growers generally in regard to thinning and packing, and this has doubtless helped to maintain prices at better levels than would otherwise have been possible.

The opening of the stone fruit season was rather later than usual and supplies came in very steadily until Christmas week. A very sudden increase then occurred, and, as weather conditions were very unfavourable from a point of public demand, market conditions proved most difficult and values fell away. After the holidays supplies were steadier, and, considering the seasonal conditions above mentioned, reasonable rates were obtained for most quality lines.

Plums were heavily supplied. Very heavy quantities of small lines resulted in some low prices at one period.

With the exception of the holiday period prices for high-grade lines have been remarkably good in the circumstances. Many growers suffered heavy losses with the Rutherglen bug during January and a large proportion of supplies suffered in value due to the appearance being spoilt by this trouble.

Oranges and lemons were freely supplied during December and in the absence of hot weather conditions, and with other lines heavily supplied, no marked increase in values was evident until the New Year. During January supplies of oranges eased and from then on the market has been firm and many lines which were not over-attractive realised good prices. Lemons improved, and, during the exceptionally hot week experienced in February, some very substantial prices were realised. Many lines suffered in quality during the heat wave, and although demand has since eased, limited supplies have realised very good values.

It appears that the acreage planted to the early local tomatoes was much heavier than usual, and supplies on some sale days were double those of December, 1931. The demand for this line is influenced by weather conditions to a greater extent than any other, and prices were therefore on a very much lower scale than in the preceding season. The only lift in the market until after the end of the period under review was during the February heat wave, when values jumped whilst the hot weather lasted, but fell back thereafter under the pressure of decreasing public demand and increased supplies.

Apples ex cool store were available through December, although in smaller quantities than the preceding month. The tone was firm until Christmas week when the conditions mentioned in regard to other lines brought prices back rather suddenly. Very short supplies after Christmas realised good prices for a week or so. New season lines were short supplied at the beginning of January and values were very firm, easing to quite fair prices as supplies increased. Coloured apples were scarce right through to the end of February and early Jonathans have made some quite good values.

The crop of Bartlett pears has apparently been exceptionally heavy in nearly all districts, and orchard supplies have been available freely later than is usual. In the circumstances it was not possible to secure high rates, and the usual distinction between prices obtainable for pears from fruit-fly infested areas in comparison with that from free areas was particularly noticeable during February.

Vegetables.—An unusually favourable growing season during the spring and early summer induced the heaviest supplies which have been known for some years in nearly all lines. This, coupled with limited buying power, resulted in a disastrous price level throughout December and into January. The difficulty was accentuated by a very heavy metropolitan crop of potatoes for which no export outlet could be found and only nominal prices were obtainable. Quite apart from the over supply of other lines the price of potatoes had the effect of limiting the price obtainable for alternative vegetables.

The experience of Christmas week mentioned in regard to fruit was emphasised in the case of vegetables: the quantities to be offered were altogether out of relation to the public demand.

Pumpkin was at fair value early in December but soon fell away to a low price. Swedes were also in fair demand during the quarter and the prime lines realised high values at times. Cabbage during December was glutted, many lines being left unsold; during January and February, however, values improved considerably for prime lines. Beans also were heavily supplied until towards the close of February. Peas were in steady demand all through, although contrary to the usual experience they were at glut level during the Christmas season. Onions, the bulk of which were marketed from the Spearwood district during this season, were also a heavy crop, and values, although fairly good during the first part of December, fell sharply and have remained on the low side since. Although exceptional lines of both white and brown caused brisk competition, the very low price at which Victorian onions can be purchased for importation has placed a limit on the price obtainable for local onions.

Rhubarb is not in demand during the summer months as there are plenty of cheap fruits to take its place, and nominal values have been the rule.

Celery is a line that is grown plentifully; all good and well cared for lines demand high values. Water melons started soon after the New Year and values generally were good. This line depends solely on weather conditions, and growers who were fortunate enough to market their crop during the hot spell were amply rewarded. When autumn temperatures came in towards the end of February the public demand for water melons fell away heavily, although quantities increased, and values were effected correspondingly. Rock melons were heavily supplied and inferior sorts were hard to quit at satisfactory values.

Bunch lines also were heavily supplied and seldom rose above glut level until supplies eased. This also applies to lettuce.

The heat wave had the effect of destroying many lines, and phenomenally heavy supplies were replaced generally at the close of February with comparatively short offerings. Prices reached quite high levels for many lines.

Eggs.—During the first week in December many growers discontinued export operations, owing to some of the export agents reducing the rate of the advance, and this had the effect of increasing the supplies on the local market. The supplies were now becoming geater than the demand and values were declining on those ruling when export operations were at their top. On December 17th all agents

ceased packing for export, and all surplus eggs, formerly accepted for export, were placed on the local floor and it was only the Christmas demand that kept values from declining below 7d. a dozen for metropolitan new laid standard, and 6d. per dozen on metropolitan new laid hen.

After Christmas local supplies were maintained and unusually heavy supplies received from country centres. Public demand was at a minimum, and although steps were taken to cool store during this period sales were difficult and many lines were hard to quit; but for the manufacture of a substantial experimental quantity of pulp for export during this period the position might conceivably have been even more difficult.

During January values ranged as under:—

Metropolitan new laid standard	.. ..	7d.	to 10½d.
„ „ „ hen	.. .. ..	6½d.	to 10d.
„ „ „ pullet	.. .. ..	5d.	to 8½d.
Country new laid	.. ..	5d.	to 8½d.
„ stores	.. ..	4d.	to 6½d.

During the early weeks of February eggs were heavily supplied and sold to a good demand at slightly firmer values. Owing to the excessive heat prevailing, supplies arrived in a heated condition and there were numerous complaints regarding the quality. The heat also caused the fowls to moult, and the supply of standard and hen eggs was not equal to the demand. Values increased until they rose 5d. a dozen in one day to 1s. 10½d. a dozen for standard eggs. This sudden rise in price checked consumption and as the fowls re-commenced to produce almost as many eggs as before the heat wave, values fell away to the extent that they receded to 9d. a dozen for standard eggs.

Poultry.—During December supplies of all lines sold to a good demand for prime quality. Prime gobblers and turkey hens were keenly sought after and sold at good values. Prime cockerels sold at values up to 9s. pair, prime table hens to 7s. pair, Muscovy drakes to 14s. 6d. pair, Muscovy ducks to 7s. 6d. pair, turkey gobblers to £2 pair, and turkey hens to 16s. 6d. pair. After the Christmas rush supplies eased and values remained firm for prime quality. During January and February there were no turkey hens nor gobblers offering. Muscovy ducks and drakes short supplied and sold to a fair demand only. Although hens and cockerels were heavily supplied there was a keen demand for prime quality. Prime cockerels realised to 9s. a pair, and prime black or red hens to 7s. pair. White leghorns also sold to a keen demand at improved values.

Harvesting virgin land.

METEOROLOGICAL INFORMATION.

STATIONS.	TEMPERATURE.				RAINFALL.		TEMPERATURE.				RAINFALL.		TEMPERATURE.				RAINFALL.	
	Maximum.		Minimum.				Maximum.		Minimum.				Maximum.		Minimum.			
	Mean.	Highest.	Mean.	Lowest.	For Month.	Average.	Mean.	Highest.	Mean.	Lowest.	For Month.	Average.	Mean.	Highest.	Mean.	Lowest.	For Month.	Average.
	DECEMBER, 1932.						JANUARY, 1933.						FEBRUARY, 1933.					
					inches.	inches.					inches.	inches.					inches.	inches.
Chapman State Farm	89·7	105·3	60·7	50·3	·33	·24	93·2	110·0	64·3	55·8	·11	·29	97·1	114·4	66·6	56·4	*Nil*	·44
Geraldton	81·8	102·0	62·3	48·0	·06	·16	84·9	110·0	65·8	58·8	·08	·22	87·6	115·5	68·4	61·2	·01	·29
Waleibing	90·6	109·5	57·3	48·1	·08	·48	92·5	106·3	62·1	53·8	·20	·34	98·7	115·2	64·7	50·1	*Nil*	·50
Perth	80·6	96·4	59·9	49·8	·20	·57	84·4	102·6	64·9	56·8	·57	·34	90·3	112·2	66·8	58·2	·11	·42
Kalamunda	83·0	97·8	56·8	45·0	·20	·78	85·0	104·5	61·4	53·0	·63	·51	92·7	110·0	66·3	52·3	·04	·61
Bunbury	77·5	89·0	54·7	43·0	·11	·57	81·8	95·5	59·7	49·0	·67	·43	86·0	104·2	61·7	48·0	·18	·53
Bridgetown	86·4	100·2	49·4	32·5	·39	·77	87·7	106·0	55·3	43·5	·64	·55	94·0	115·0	54·9	39·5	·18	·63
Albany	22·8	91·0	56·0	47·8	·33	1·18	75·0	92·0	59·4	52·8	1·64	·83	78·5	112·6	60·7	53·2	·25	·92
Merredin State Farm	89·9	104·0	57·6	45·8	·31	·52	90·8	102·3	61·0	52·9	·24	·49	96·6	110·3	64·9	53·1	*Nil*	·54
Northam	89·8	104·8	58·3	47·2	·13	·35	90·9	103·0	61·8	56·2	·21	·27	97·5	114·9	64·3	52·6	·10	·38
York	88·4	101·5	56·5	43·0	·12	·41	90·0	103·5	60·5	54·5	·25	·30	96·1	113·0	62·8	52·0	·19	·43
Narrogin State Farm	85·5	98·0	50·7	36·4	·45	·57	87·5	99·8	55·4	49·8	1·34	·33	92·8	109·1	57·6	42·2	*Nil*	·53
Katanning	84·4	97·0	51·6	37·6	·28	·63	86·4	101·0	55·9	47·7	1·05	·37	91·9	112·3	59·4	48·7	·31	·54
Cape Leeuwin ...	70·4	79·5	59·2	54·5	·27	·83	71·2	97·0	62·4	56·0	·47	·64	77·2	109·0	65·2	61·5	·27	·83

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